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THE HORSELESS CARRIAGE CLUB

GAZETTE

FOUNDED NOVEMBER 14, 1937, LOS ANGELES, CALIFORNIA

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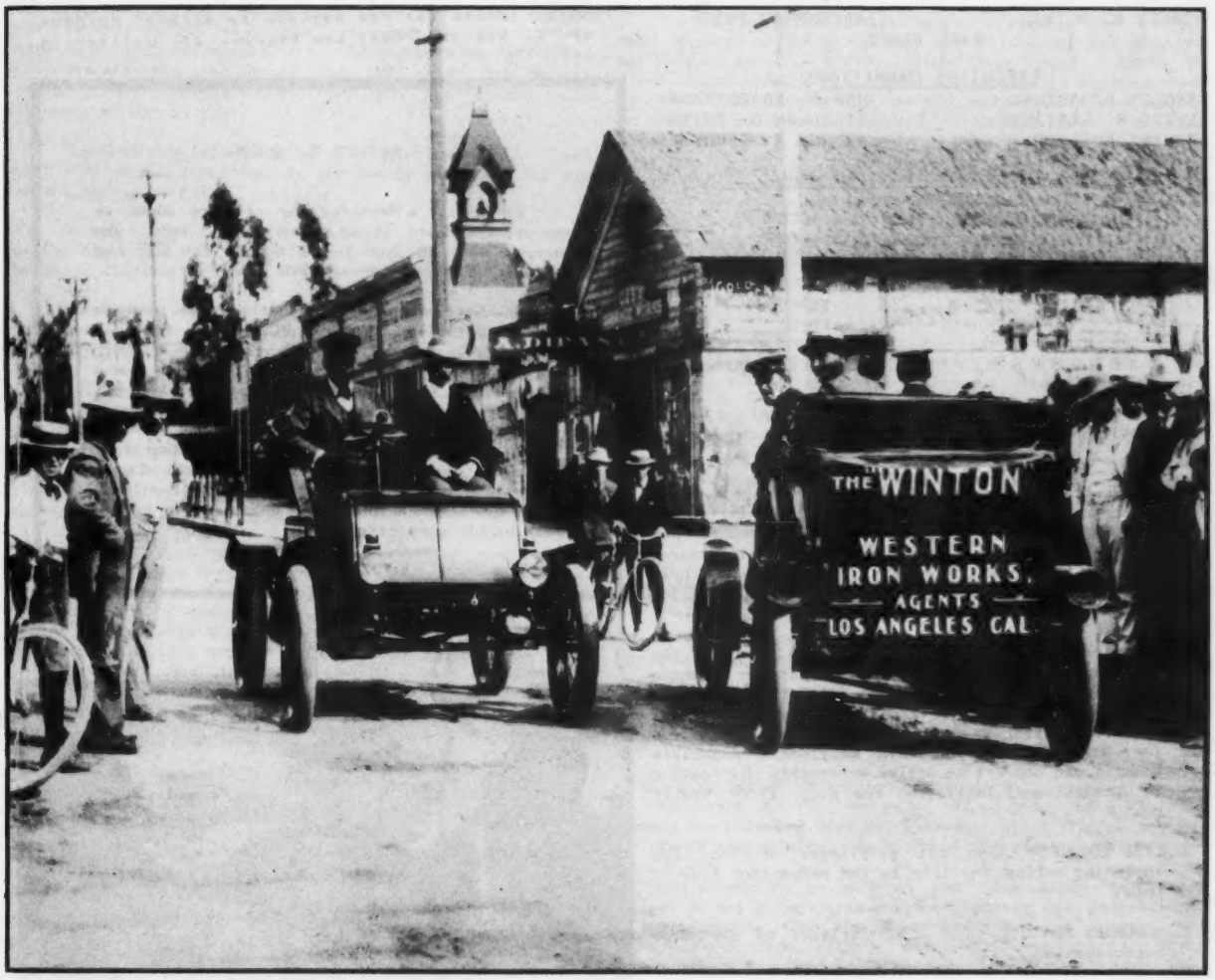

THE WINTON INVADES SOUTHERN CALIFORNIA
see article

THE
HORSELESS CARRIAGE CLUB
Founded in Los Angeles - November 14th, 1937

A non-profit corporation founded by and for Automotive Antiquarians and dedicated to the preservation of the old time automobiles together with their accessories, archives and romantic lore.

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THE
HORSELESS CARRIAGE CLUB GAZETTE
Official Publication of The Horseless Carriage Club.

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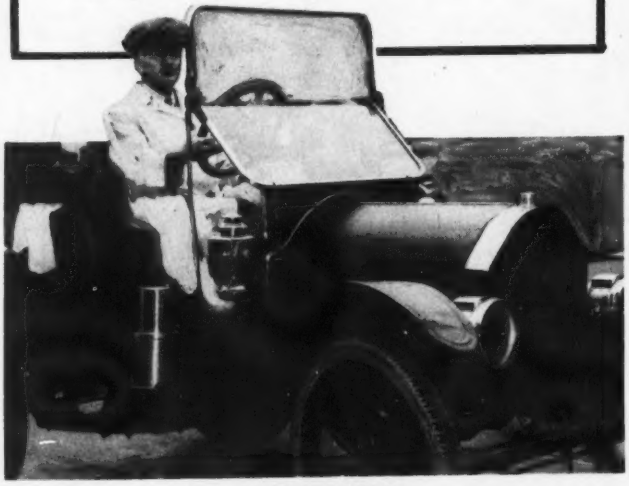
ARTHUR O. KOTT

It is with a deep feeling of loss that we report the death of Mr. Arthur O. Kott, who passed away at his home, 803 W. 76th St., Los Angeles, September 29th, 1946. Age, 64 years.

Mr. Kott was one of the better known members of the Horseless Carriage Club. He attended Field Meets regularly with his one-cylinder Brush and took an active part in the programs. He owned the Brush for thirty years and kept it in showroom condition.

By occupation Mr. Kott was an electrical mechanic. He was born at Fredericksburgh, Texas, September 20th, 1882, and moved to California in 1914. His absence from Field Meets will be keenly felt by his many friends.



ARTHUR O KOTT

THE WINTON INVADES SOUTHERN CALIFORNIA

by Arthur Twohy

The following account of a tour from Los Angeles to San Diego and return by automobile in May of 1901 is quite interesting. The articles are copied from the Los Angeles SPORTSMAN and were lent to me by Mr. E. B. Waterman, from whom I purchased the one cylinder Winton which I later traded to Lindley Bothwell. This tour was taken in another one cylinder Winton, shown in the center of the picture. Mr. Waterman is at the wheel. He tells me that this picture was taken at El Monte in 1901. The camera, to take this picture, was placed on the rear of the Winton first mentioned. These three cars had been shipped out from the factory at the same time. Lindley Bothwell's car has tiller steering, but the one Waterman is driving has a wheel. The factory was just changing over from tiller to wheel steering models. This picture shows them on a trip they made to San Bernardino to demonstrate to the different wholesale houses in Los Angeles that the new-fangled automobile was the thing for them to buy for their salesmen to use in calling on the trade. To demonstrate this, they took the three Winton cars, gathered up the different wholesale salesmen and drove them out to San Bernardino for lunch and back the same day. This was considered such a trip in those days that the newspapers featured it in quite an article. Mr. Waterman, when I saw him in 1929, was a white-haired gentlemen.

Getting back to the magazine articles which follow, Mr. Waterman lent me these to copy, but unfortunately they are not complete. The articles are as follows:-

SAN DIEGO AND BACK BY AUTOMOBILE

by Charles Fuller Gates

Up the coast from San Diego to Los Angeles by the country roads is only 140 miles, but many of the roads are so little used that with the sand and steep grades the distance seems more like 500 miles.

Going down by the inland route, which, through Corona, Elsinore, Temecula, and Escondido is some 170 miles, we made that distance in two days, but returning on the shorter route we used up twice that time. Of course some unexpected accidents made the time slower, but the roads are really very bad. Any wheelman who has been over the coast route will bear me out on that.

The first day retruning, we did not leave San Diego until 4:30 in the afternoon, so the twenty miles to Del Mar was not very slow going.

As was stated in last week's issue, we put up there for the night and indulged in a surf bath that evening with the water all afire from the phosphorescence.

Leaving the remains of what was to have been quite a coast town—if the boom had lasted, we were persuaded to try beach riding with our automobile. It took us fifteen minutes to cross the deep sand to get onto the hard beach.

This was probably the first appearance of an automobile as a beach runner, at least it was the first time a heavy automobile was used on the Pacific. In the early morning we sailed along the hard beach at from sixteen to nineteen miles an hour, and with the Winton's steady steering our tracks were as straight as railroad rails.

At times frowning cliffs rose almost perpendicularly beside us while the receding waves were but a little way off. Once we stopped to take a photograph, and using a tripod to more carefully focus the picture, took a little time. Imagine our feelings when we discovered that the wheels had sunken into the sand several inches, showing that to stop was dangerous. Another time we came to a bold point we had seen for a long way ahead. Before reaching it, it seemed to us that the rough rocks ran unbroken out into the surf. Naturally we were a bit scared.

On reaching the point, we found it possible to pass by shooting around the rocks when the waves went out and then shooting inshore before the waves could strike us. This was a delicate piece of steering, but we made it all right, but we decided then and there to leave the beach at the first convenient place.

After running on the beach for miles we came to the country road, which at this place parallels the beach. The road and an old bridge showed that the beach was much used and the road seldom. How to get through the deep and soft sand to reach the highway only a hundred yards away, was a puzzle. Our nine horse-power would not send the machine through such sand, for the sand was like soft snow and there was quite a grade to climb at the same time.

My partner, Mr. Waterman, suggested seaweed, so we gathered about a wagon load of it and strewed it along the course we intended to take. The seaweed was a failure. Then we dug into the sand to see if we could unearth a solid bottom and found that unattainable.

I sighted some bath houses and a picnic sun shelter some distance up the beach and, on visiting it, was able to get hold of some old boards. With these boards placed in front of the wheels as a track, and constantly shifting them, as is done in house-moving, we got over the soft sand and in an hour had covered the hundred yards and were near the highway.

Then to get onto the road, which led up a steep, sandy grade to the bluffs above, was another job. We accomplished this by digging to hardpan with our hands and by using the broken boards. Whether we could make the grade next worried us, as the surface was soft for about three inches on the top, but we made it by nursing our hill climbing gear and speeding the engine up.

You may be sure that we were satisfied to leave beach riding to others thereafter. I never did like riding on the beach, anyway, not even with a bicycle. Several years ago on this same beach, an old couple living in San Diego got caught by the tide and had to camp on the rocks all of one cold night with their feet and bicycles just out of reach of the waves, while behind them the bluff towered for scores of feet. I thought of their experience several times that morning.

Along the bluff at the point where we left the shore, the road runs right beside the edge. The air was filling with fog, and we had the pleasure of a cool morning ride after we had gotten safely away from the beach.

Then came several miles of good road into and through Carlsbad and South Oceanside, and then we arrived at Oceanside.

At the latter place our Winton attracted considerable attention, it being the first automobile ever seen in Oceanside.

While one of us secured gasoline, the other filled up the water tank and then we were off up the main street towards San Luis Rey Mission, some four miles inland, and in the pretty valley along the river of the same name.

In attempting to go down the long grade into the valley, we met a two-horse wagon containing five generations of Indian women. When the horses began to show fright, we backed up the grade, although nearly half-way down it. Then we ran into a farmyard and a hog pasture, got through two barb wire fences and finally reached the road below the point where we had started back, and, keeping the teams back at the bottom, signaled to my companion, who then ran the automobile down the grade without upsetting any wagons. In

the long lane across the low valley at the bottom were several more teams.

The first two were heavy teams, and, as we ran close to the fence on our side, the drivers got their horses past. The third was a light carriage with a chesnut horse driven by a woman. We tried hard to get by this horse, but the only way was to unhitch the animal, roll the buggy by, and then force the rearing and pitching horse to waltz by. Then we hitched the horse to the carriage again, and drove it a few rods farther and turned it over to the woman.

We reached San Luis Rey in the mid-forenoon and stopped at the combined store, hotel, post office, and saloon. Opposite was the tule building which had just been used for a Spanish fiesta in honor of the anniversary of the founding of Mission of San Luis Rey de Francia, and was to again be used for the Mexican Independence Day, which was programmed for a week later. We found a genuine Mexican restaurant running in the fiesta tule building and enjoyed Mexican cooking for a day and a half, while we stopped at the mission to photograph and view the old ruins and to make some repairs to our Winton.

* * * * * * *

It is indeed an interesting ride from San Luis Rey to Capistrano, a distance of about thirty miles. On this thirty miles there are but two houses after you get fairly out of sight of San Luis Rey Mission.

Think of an all day ride, and a long day's ride if by horse and buggy! Across one big ranch, with pasture land and cattle all about you! It is an interesting ride by bicycle, especially when the cattle chase you for miles, as many a rider, including the writer, knows from experience.

Leaving the old mission and the little cross-roads village about it and getting across the wide river, which was about dry last September when we crossed it, you at once begin to climb up into the hills known as Wire Mountains, until at the summit you are at an altitude from which you may see the surrounding country to an advantage. No doubt Father Serra and other padres of mission days, a hundred years ago, stopped at this summit as we did and looked back at the grand old mission, valley, and river, and rested their weary feet before again trudging on down into the valley of the Santa Margarita and on up a dark, narrow canyon onto the broad mesa that extends half way to Capistrano, the next mission valley.

But we did not stop at the top of Wire Mountains to rest, although we spent an hour and a half on that dry and barren hill top. On the contrary, our stop was to experiment with our dry batteries and see why the spark was so weak, for we knew that up that long canyon beyond the Santa Margarita we were to strike some real grades, where we wanted regular and strong explosions in our motor. Finally we found out how to throw both sets of batteries together and then we had a spark that would fire any old charge that could get into the firing chamber. The sparking arrangement is to a gasoline automobile what the heart is to a human being.

Fortunately there was no water in the Santa Margarita river, although there was sand enough. The latter was avoided somewhat by running down the meadow and keeping off the beaten track of travel, while the river bed proper was gravelly.

Climbing that dark canyon, we found near the top a piece of hill climbing that we would never have made if I had not gotten out and taken a turn with my shoulder, while the engine was nursed along in short quick jerks. It was steeper than anything anywhere about or near Los Angeles, probably 35 per cent. But that was not to be the end, for crossing the long Los Flores mesa, the table land is often cut by narrow box canyons, that have to be crossed by diving down into them and flying up the other side, with a compound curve on each side.

At the bottom of each box canyon is deep sand, alluvial deposit from spring and winter storms, while the grade on the sides usually reaches 40 per cent in the steepest portion.

We found it necessary to fly these dips in order to avoid getting stuck at the bottom, and after we had taken a half a dozen we met out Waterloo. It was like the rest, but probably narrower. On the farther side, as we left the bed of sand, the decomposed rock wall had been worn off abruptly until it was much like the curb of a city street. We struck it full tilt. Our left front spring had been broken in Keyes Canyon, on the down trip, and was so patched up that it could not break again, but the right-hand front spring had had the lower layer broken in a hole on the run into Del Mar.

Well, we finished that spring—it broke into seven pieces. The nearest town was Capistrano, some twenty odd miles ahead. We jiggled along to the farm house of the big ranch, and, though the road at that point was badly washed out, we got over and through it and into the lane to the Los Flores ranch-house, where we hoped to fix up some sort of a spring.

At the farm house we bribed the Chinese cook to get us an early noon dinner, and we began to explore the scrap heap of used up farm implements for an old spring. We found one that we thought would do and began work in front of the farm blacksmith.

* * * * * * * * * * * *

There is a big stretch of country between Oceanside and Capistrano, about thirty miles by highway, and to cross this (most of which is within the big ranch, said to be the largest Spanish grant in the State, the Los Flores), it is best to go around by San Luis Rey, as the direct route on the coast or near the coast has several fords. Of course, an automobile will ford shallow streams, but it is best to avoid fords at all times, if possible.

The roads across the Las Flores Ranch, as a whole, are excellent, but there are spots! And these bits of bad going in automobile touring are where the troubles always occur.

In an hour and a half at the Los Flores farmhouse we had fitted an old elliptical spring to our automobile, using a piece of rubber hose chopped up in pieces and wired together, for a buffer, and were on our way toward Los Angeles.

There was but one big delay before getting to Capistrano, but that little accident cost four hours. There were short delays for sand twice, once on the ocean beach at San Onofre, where the country road debouches onto the beach to avoid crossing the canyon and the bold bluff at that point. Here the sand was so deep that the engine would not take the carriage through unaided, but by using my back against the back of the carriage, speeding up the engine and throwing in the hill-climbing gear, we could move a few feet at a time. In the next canyon we maneuvered around in crossing the river bottom, and got across the dry bed without getting stuck in the sand.

We were not so fortunate at San Juan by the Sea. Just as we were leaving the sea shore road to turn inland our chain began to climb the sprocket wheel to the engine, and on investigation we found that the belt to the rotary water pump had got loose and been caught by the chain, and thus was being ground up on the sprocket wheel.

While this was but a trivial matter, and one caused by carelessness, it was difficult to get at the little pieces of leather wedged in under the big chain.

We pulled up into Capistrano after dark without our pump working, and routed out the hotel people, for we were still supperless.

The Hotel Mendleson at Capistrano is like the hotels at San Luis Rey and Pala, combination of post office, store, hotel, and general information bureau. Capistrano is quite a village, though, as there is another hotel and several stores.

There is every convenience to be desired at the mission town of Capistrano, so that this should be a favorite automobile run hereafter.

San Juan Capistrano Mission is indeed inviting, and many travelers enjoy its ruins more than those of any other mission. The writer, as an amateur photographer, finds always fresh points of view for pictures, and others have the same experience.

The bell tower, from both sides, makes interesting photographic souvenirs. The corridors seem to have no limit to variety, and the whole ruins, taken from any point, makes a good picture.

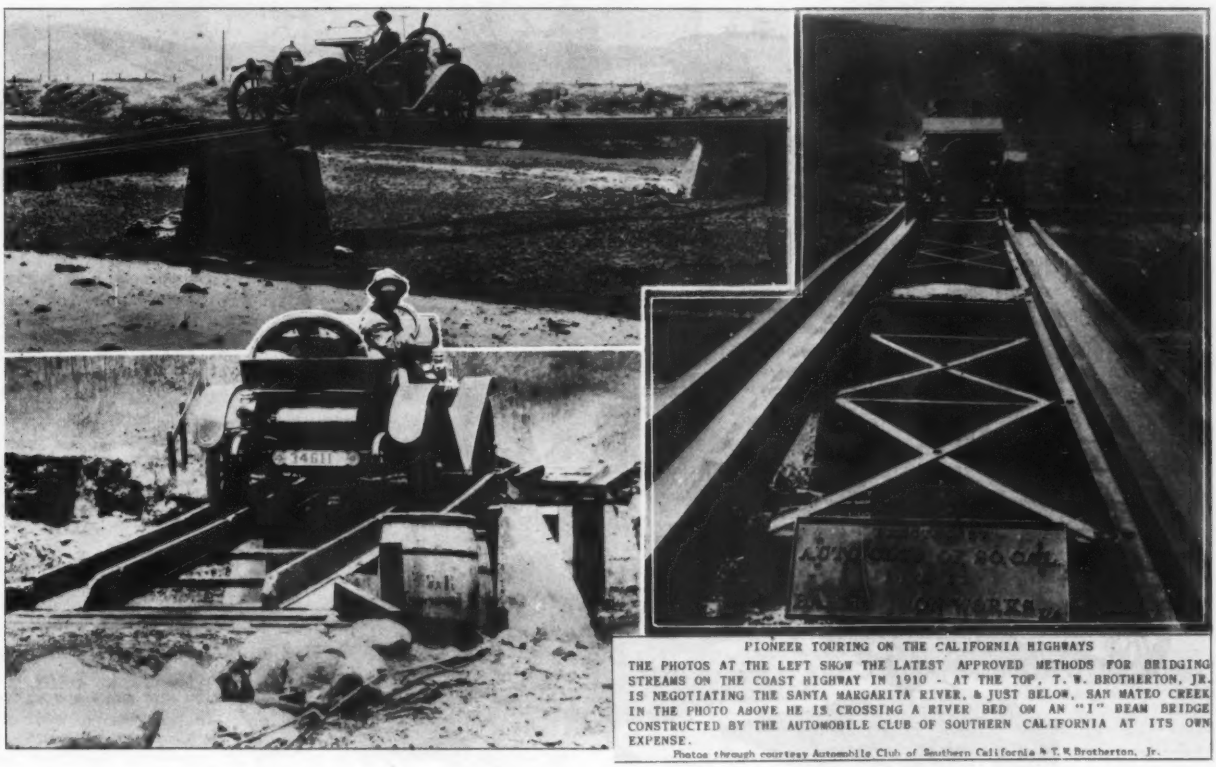
The next morning, obtaining a belt off a cream shaker, we soon had our pump working, and ran the 62 miles on in to Los Angeles in about four hours, for the roads were good and the hills few.

The country road from Capistrano to Santa Ana is picturesque and generally good, while the straight stretches offer chances for speed if a fast machine is used.

Going down the coast route through Whittier, Fullerton, Anaheim, Santa Ana, and Tustin, to Capistrano is an easy route for automobiles, as the big grades and bad roads are below Capistrano on the San Diego trip.

AN INTERESTING TOUR

"E. B. Waterman, of Los Angeles, California, recently enjoyed a delightful 500 mile automobile trip through the southern part of California. He was accompanied by John Fuller Gates, and both gentlemen report having had an excellent outing. On the road a four-mule team was met, driven with "jerk line". Upon seeing the automobile, the lead mules proclaimed their objections by backing around and becoming entangled in the harness. The driver, for the time being, abandoned control and trusted to Providence and the ability of the automobilists to set matters right."



PIONEER TOURING ON THE CALIFORNIA HIGHWAYS

THE PHOTOS AT THE LEFT SHOW THE LATEST APPROVED METHODS FOR BRIDGING STREAMS ON THE COAST HIGHWAY IN 1910 - AT THE TOP, T. W. BROTHERTON, JR. IS NEGOTIATING THE SANTA MARGARITA RIVER, & JUST BELOW, SAN MATEO CREEK. IN THE PHOTO ABOVE HE IS CROSSING A RIVER BED ON AN "I" BEAM BRIDGE CONSTRUCTED BY THE AUTOMOBILE CLUB OF SOUTHERN CALIFORNIA AT ITS OWN EXPENSE.

Photos through courtesy Automobile Club of Southern California & T. W. Brotherton, Jr.

St. LOUIS REGIONAL GROUP

ENJOYS TWO INTERESTING MEETINGS

The St. Louis Regional Group of The Horseless Carriage Club met at the factory of Mr. George P. Dorris, former manufacturer of the "Dorris" and "St. Louis" automobiles, on September 29th, 1946. Several antique automobiles were present, including Mr. Dorris's 1902 St. Louis, a 1904 Maxwell owned by Mr. James Gregory, a 1918 Dodge touring owned by Mr. Herbert Restetsky, a 1927 Moon Roadster owned Mr. McLaran Sawyer. During the meeting, Mr. Sawyer presented Mr. Dorris with a linen duster.

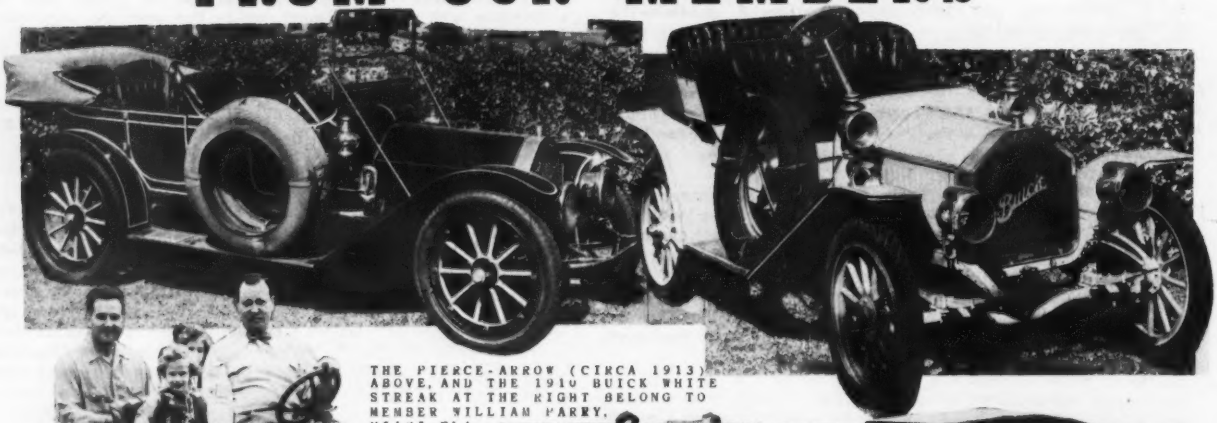
Director Deeken introduced visitors and made a brief talk about the Club. Several applications for membership were accepted. Plans were made for another meeting to be held in November.

On October 19th, 1946 the Club, together with many visitors, were entertained by a demonstration of Psych. Physical Tests sponsored by the Board of Education of the City of St. Louis and the Automobile Club of Missouri. Mr. Carlton of the American Automobile Association, Washington, D. C., was the Educational consultant. He spent a week with the Automobile Club giving lectures to High School Teachers of St. Louis on "Driver Education and Training", thus helping the teachers to educate boys and girls who are in their teens to become better and safer drivers.

Following Mr. Carlton's talk, several motion pictures were screened, including one of the recent revival of the Glidden Tour. Eighty persons attended this meeting.

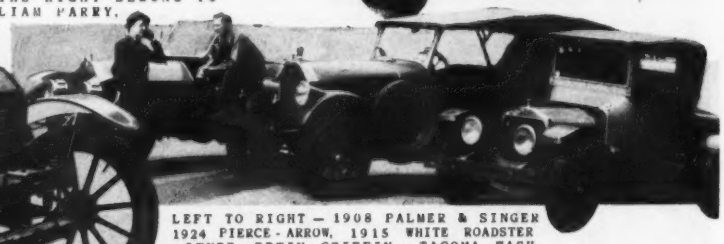
Wayne Bledsoe
Secretary, St. Louis R. G.

FROM OUR MEMBERS



THE PIERCE-ARROW (CIRCA 1913) ABOVE, AND THE 1910 BUICK WHITE STREAK AT THE RIGHT BELONG TO MEMBER WILLIAM HARRY, MIAMI, FLA.

ARTHUR B. SEGAL BOASTS A VERY FINE BRUSH (CIRCA 1910). WITH HIM ARE DAUGHTERS AND JOSEPH HASTERNIK OF CHICAGO.



LEFT TO RIGHT — 1908 PALMER & SINGER 1924 PIERCE-ARROW, 1915 WHITE ROADSTER OWNER - EDWIN GRIFFIN - TACOMA, WASH.

CHIEF C. L. DOWNING GRAND JUNCTION, COLORADO, STANDS BESIDE HIS CADILLAC, A 1903 MODEL ONE CYLINDER

ABOVE HOWARD BOLT, HUTCHINSON, KANSAS IN 1914 MODEL T FORD

ABOVE, BROTHERS WARWICK & DOUGLAS EASTWOOD IN THEIR 1910 HUPMOBILE

EVERETT MILLER'S LATE ACQUISITION - A 1908 AUTO-BUG.

RAY DOUGHERTY'S WIFE & CHILDREN DRESSED IN COSTUME OF THE PERIOD POSE IN HIS 1909 REO

HARRY JOHNSON DRIVES A 1910 FORD
FROM LOS ANGELES TO JOIN GLIDDEN TOUR

This Spring, when the Glidden Tour was first announced, Mrs. Johnson and I began planning for the trip. The car, a 1910 Model T Ford Torpedo Roadster, was taken apart and rebuilt from the frame up until it was in as good a condition as when it left the factory. A paint job, a new top, and new tires were provided, but great care was exercised to keep the car original except that a water pump and an auxiliary oiler were added, which, however, were standard Ford Accessories that sold by the thousands in the heyday of the Model T.

Ellen's job was to assemble and pack enough clothing and stuff for at least two weeks on the road and also clothing so that we could dress up for the dinners and entertainments when we joined the rest of the tour in the East. After she had collected everything and reduced the quantity to an absolute minimum for five suitcases, she hit the ceiling for no reason at all when I informed her that the car was so small there was only room for one small suitcase and that she would have to cut down a little. Well, we had quite a discussion on that subject and reached a compromised agreement, as they say in the papers when a strike is settled, and space was provided for one more suitcase.

At 1:30 in the afternoon, Sunday, August 11th, with the well wishes and misgivings of many friends and the gang at the engine house, we started off with the intention of driving across the desert and getting well into Arizona during the night and before the weather warmed up the next morning. We needn't have taken this precaution as we had one suitcase empty by the time we got to Banning to get enough clothes to keep warm and we did not have any hot weather till we reached Texas. It seems that August is the rainy season in Arizona and New Mexico and although we fortunately did not have to drive through any rain, there were pools of water along the highway for miles indicating recent rains, and the weather was quite cool.

Driving across country as we did in an old car, we had many interesting experiences and, of course, at every stop a crowd would gather around to look us over and ask questions. While driving through the Missouri Ozarks, we passed three cars and a truck on an uphill grade. About a mile farther on, a state trooper stopped us and proceeded to give me a well deserved lecture on the foolhardiness of such driving, then proceeded to explain that old cars do not have good brakes. As he finished, he shook his head and said, "I doubt if you will reach St. Louis the way you're driving."

We stopped a day and a half in Chicago to visit friends and arrived in Dearborn the evening of the 20th after eight days of driving from Los Angeles. A representative of the Ford Motor Company was waiting for us at the Dearborn Inn and he arranged for us to stay there. We had dinner with him that evening and afterwards he outlined the program for the next day and gave us directions for getting down to meet the boat next morning. We were up bright and early the next morning and drove down to the pier of the D. & C. Navigation Company to meet the eastern group coming from Buffalo. Also waiting there were the cars of the Michigan group, with whom we proceeded to get acquainted while the boat was being docked. The Mayor of Detroit, as well as many representatives of the Ford Motor Co. were there to welcome the tour. Also present were many reporters and photographers and it was quite an occasion. The first car off the boat was the beautiful Pierce of Sam Baily of Philadelphia and soon after we were greeted by the sight of James Melton in his elegant red Stanley Steamer.

After the interviews and official greetings were over, the cars were lined up for a parade through downtown Detroit and then up Michigan Ave. to Dearborn. At Dearborn arrangements had been made to house and feed the entire group for the day and a half they were the guests of the Ford Motor Co. A large tent was provided for the cars and two mechanics were in constant attendance to make any adjustments or repairs possible. Also, I would like to mention that the Firestone Co. provided two service trucks that followed the tour from New York to Youngstown, giving much valuable service and the Texaco Co. gave $20.00 worth of gasoline and oil to each car entered.

After everyone was settled, we went to the Dearborn Inn for lunch and afterward to Greenfield Village and Ford's museum to spend the afternoon. The museum is the best I have ever seen, but a person cannot possibly see everything there in the amount of time we had to spend. I would like to be able to return sometime and spend several days there. That evening a banquet was given at the Dearborn Inn with James Melton acting as M. C. and different Ford officials were introduced. After the banquet, the group retired to Camp Legion for an informal social. Everyone was friendly and we proceeded to get better acquainted with our fellow Glidden Tourists and everyone seemed to be having a wonderful time. The next morning some took advantage of the time to take another look at the museum, others polished and checked over their cars, while we took the opportunity to look a few of the cars over. I have never seen so many gorgeous antique automobiles and so little time to look at them. About one o'clock everyone got in their cars for another parade down through the streets of Detroit to the wharf and warehouse of the Detroit and Cleveland Navigation Co., where the cars were stored until time to load them on the eleven o'clock boat for Cleveland

As soon as the cars were safely stored, the group was picked up by a fleet of new army "ducks" sent over by the General Motors Corp. We were all quite thrilled since this was to be a new sensation for nearly everyone in the group. We were taken for a demonstration ride out on the Detroit River to an island off shore and then back over a bridge back to town. The ride was a lot of fun and it is quite an experience to be riding along on land and then just calmly ride down to the beach and out on to the water without even hesitating. After returning to town, the party was driven right up to the main entrance of the Statler Hotel, where everybody got out. There was a little time to freshen up and then we met in a reception room for cocktails and from there into the banquet room. The banquet was a gala affair after which several prominent General Motors men spoke, including "Doc" Kettering, Charlie Chayne, and W. G. Llewellyn, Vice President of the Corp.

At ten o'clock we were bade farewell and the group was taken by bus to the dock to load the cars on the boat for the night trip to Cleveland. The boat was a large side wheeler built along elegant lines reminiscent of the '90's having a grand salon with panelled walls and elaborate chandeliers and the grand staircase leading to the staterooms on the upper deck. It was very much in keeping with the spirit of the Glidden Tour and the old cars. We felt the throb of the paddle wheels as the boat got under way and everyone gathered in the dining room for an informal social and dancing before retiring and many interesting experiences of the tour were recounted.

The next morning we were awakened by the boat bumping against the pier as it came to dock in Cleveland. There was much excitement as everyone had a hurried breakfast and prepared to get his car off. After disembarking and arranging for rooms at the Hotel Cleveland, where we all had reservations, a parade was formed and the group was escorted out to the Thompson Products factory and museum. This is one of the finest museums of automobiliana in the country as the entire street floor of the factory is devoted to the display, and to a fine workshop in the rear for reconditioning the cars as they are brought in in the rough. An outstanding feature of the museum is called "Main Street, Thompsonville," which consists of a typical street scene at the turn of the century, complete with stores, lifesize figures and early automobiles. It even has a saloon with a family entrance and a figure of a small child peeking under the swinging doors at the front.

After looking at the museum and having luncheon there, the cars were assembled and driven to the Mall in the center of Cleveland, where they were on public display with police guard for two hours in the afternoon. That evening a banquet was given by the Thomoson Co. at the Hotel Cleveland. At all the dinners and banquets we attended, without exception, the speakers were very interesting as they seemed to be carried away with the old car idea and proceeded to reminisce on subjects dear to the old car collector.

The following morning, the cars were lined up in preparation for the drive to Columbiana, a distance of 70 miles. This was particularly interesting to Ellen and me as it was the only opportunity afforded us to drive any distance with the whole group. An escort of Ohio State Police was provided and we were soon on our way in high spirits. There were people gathered at every crossroad and little town we passed to cheer us on and everywhere there were photographers taking pictures of the procession.

The most stirring sight of all was in Columbiana. In 1907 one of the original Glidden Tours had passed through this town and now it seemed that the entire town was out to greet the second Glidden Tour to enter their city. Many of the people were in costume and two parties had even come down in old cars. The highway makes a turn around the town square and the band was out there playing old tunes and they even had a policeman dressed in an early day uniform directing traffic. From Columbiana out to the old Firestone farm, a distance of two or three miles, the entire roadside was lined with people in holiday dress who were waiting to see the tour go by. Many had brought basket lunches and were picnicking on the spot as the countryside is very beautiful and suitable for it.

At the Firestone farm, the tour was greeted by Harvey Firestone, Jr. An enclosure was provided to park the cars and we were escorted to a huge tent that had been set up as a banquet hall. When the 1907 Glidden Tour had passed here, they were on a schedule and couldn't stop, so Harvey Firestone (Sr.) with his family had stood by the roadside and handed baskets filled with delicious home cooked chicken dinners to the contestants as they passed, and now, in keeping with that early event, we were treated to one of the most delicious chicken dinners I have ever eaten, complete with fresh corn on the cob and home made apple pie.

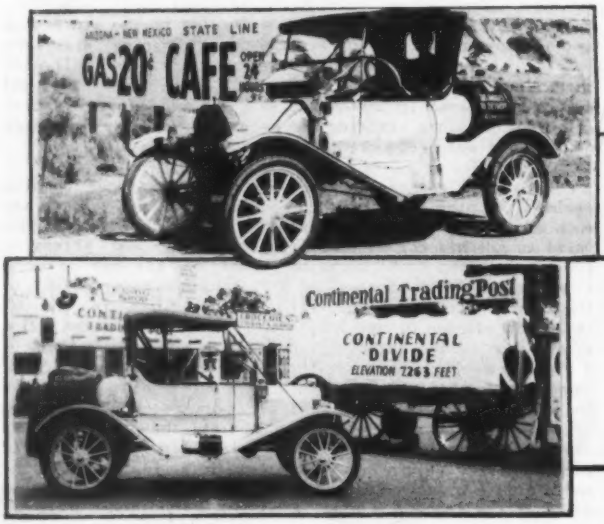
After dinner, James Melton, acting as master of ceremonies, introduced our host, who expressed his pleasure for being able to entertain another Glidden Tour. Mr. Firestone told of the beginnings of Firestone. He said the present farmhouse, where his father was born, is supposedly the oldest brick house in Ohio.

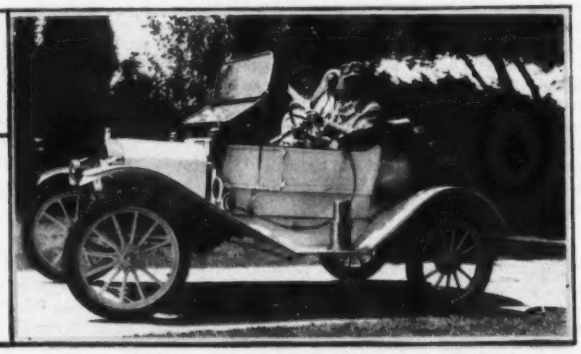
Mr. Melton next announced the end of the tour and said, "It was a week of grand fun and experiences, and I really rather wish it weren't over." He then made the presentation of six large silver cups to members of the tour for outstanding performance. Major Augustus Post, who as a driver participated in several of the original Glidden Tours, received a cup. Jerry Fauth and Walter Marr each received a cup for their work in contributing to the success of the tour. Ellen and I received one for driving the longest distance as we had come three times as far as anyone else. Fred Hoyle, who negotiated the entire distance in the expeditionJs oldest car, a 1904 Oldsmobile, was given a cup. This award was received with much applause because when the tour started everyone had thought the little one cylinder car would not make it, and it looked as though they were right when it burned out a connecting rod bearing on the first day out. However, they had not reckoned on the luck and determination of Mr. Hoyle. As luck would have it, the mishap occured in front of a blacksmith shop that was run by an old fellow who, after coming out and looking the car over, announced that he had worked in the Oldsmobile factory when the car was built and that he knew how to fix it. The two of them worked all that night, as it was necessary to remove the body and take the engine out to repair it. By morning the job was done and Mr. Hoyle drove all that day and the next night to catch up with the tour, a truly remarkable performance. The sixth cup was awarded to E. Bennett Beatty for the most interesting car, a 1905 Royal Tourist which had been in the family since its purchase new by Beatty's father. It had been on blocks as a family show piece until young Beatty heard of the tour and restored it to original mint condition.

At the close, Mr. Melton was accorded a rousing ovation by the drivers and guests for his efforts in arranging & conducting the entire tour, making all hotel reservations, arranging meals, and even scheduling special stops where non leaded gasoline and kerosene could be had according to individual needs. For his contribution to the tour, it was announced, Peter Helck, artist and old car enthusiast, is to paint a picture of some tour incident as a gift of the participants.

A few that did not have far to go started home that night, but the most of us stayed overnight in nearby Youngstown and began the homeward trip the next day. We made the trip home from Youngstown in seven days, a distance of about 2600 miles. The Ford ran very well the entire distance and took all the mountains in high. The only troubles were two broken fan blades and a broken wishbone, all of which were quickly repaired by welding, and we had two flat tires. One of these was my fault as I pinched a tube when I switched the front tires in Chicago.

Our trip was a most enjoyable experience, and I think everyone who is able should plan to attend if there is another Glidden Tour. Ever since Ellen and I became active in the old car hobby, we have looked forward to meeting members of the Eastern Clubs. The 1946 Glidden Tour afforded us that opportunity, and it was a pleasure to be with them for four of the most pleasant days of our lives.





PHOTOS OF HARRY AND ELLEN JOHNSON EN ROUTE TO THE GLIDDEN TOUR

PLEASURE AUTOMOBILES

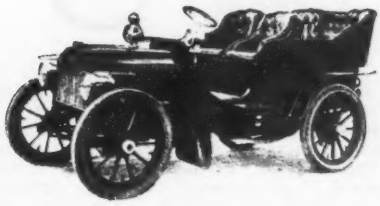
A LIST OF THOSE ON THE AMERICAN MARKET

FRANK LESLIE'S MAGAZINE - JANUARY, 1904

Gasoline Carriages

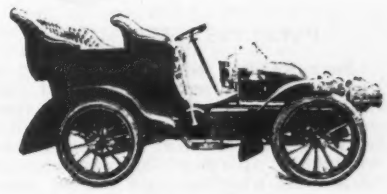
THE PIERCE ARROW.

Double cylinder, 15-h.p., water cooled, vertical engine in front; sliding speed gears; bevel-gear transmission; 3 speeds and reverse; tubular frame; 32-inch artillery wheels and 3½-inch tires; wheelbase, 81 inches; standard tread; gasoline capacity, 10 gallons; water, 5 gallons; weight, 1,700 pounds; seats 5 persons; price, $2,500.—George N. Pierce Co., Buffalo, N. Y.



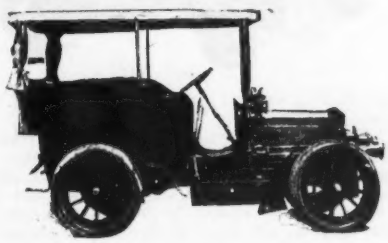
THE PACKARD, MODEL L.

Four cylinder, 20-h.p., water cooled, vertical motor in front; sliding speed gears, transmission direct or high gear; cellular radiator with fan; throttle control; steel frame, with Packard system of 3-point spring suspension; 34-inch artillery wheels and 4-inch tires; weight, 1,850 pounds; wheelbase, 94 inches; seats 5 persons; price, $3,000.—Packard Motor Car Co., Detroit, Mich.



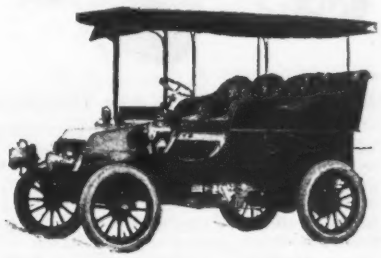
LOCOMOBILE TOURING CAR.

Four cylinder, 16-h.p., water cooled, vertical motor in front; sliding-gear transmission; 3 speeds and reverse; angle-steel frame; 34-inch artillery wheels; 3½-inch tires; wheelbase, 84 inches; tread, 51 inches; gasoline capacity, 15 gallons; weight, 2,200 pounds; seats 5 persons; price, $4,500. Nine-h.p., double-cylinder car sells for $2,000.—The Locomobile Co. of America, Bridgeport, Conn.



APPERSON TOURING CAR.

Four cylinder, 40-h.p., water cooled, vertical motor in front; cellular radiator; 4 speeds and reverse; steel frame; 34-inch artillery wheels; wheelbase, 96 inches; standard tread; gasoline capacity, 20 gallons; water, 5 gallons; weight, 2,800 pounds; seats 6 persons; complete, with top and electric lights, $6,000. A 25-h.p. car, of similar construction, weighing 1,800 pounds, sells for $3,500.—Apperson Bros. Automobile Co., Kokomo, Ind.

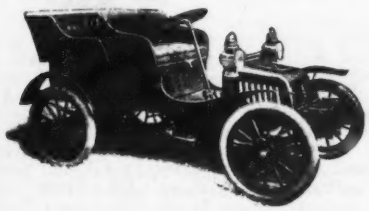


THE 1904 WINTON.

Double cylinder, 20-h.p., water cooled, horizontal engine mounted amidships; sliding-gear transmission; channel and angle-steel frame; 34-inch artillery wheels; wheelbase, 7 feet; tread, 56 inches; gasoline capacity, 12 gallons; water, 11 gallons; weight, 2,300 pounds; seats 5 persons; price, $2,500.—The Winton Motor Carriage Co., Cleveland, Ohio.

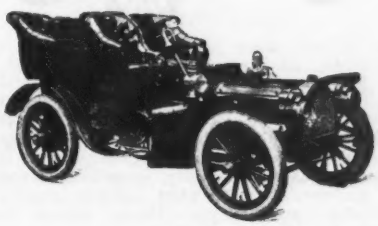
THE STEARNS.

Double cylinder, 24-h.p., water cooled, horizontal opposed engine mounted amidships; 3 speeds and reverse; all controls at steering wheel; armored-wood frame; 34-inch artillery wheels and 4 and 4½-inch tires; wheelbase, 96 inches; standard tread; gasoline capacity, 17 gallons; water, 8 gallons; weight, 2,800 pounds; seats 6 persons; price, $3,000.—The F. B. Stearns Co., Cleveland, Ohio.



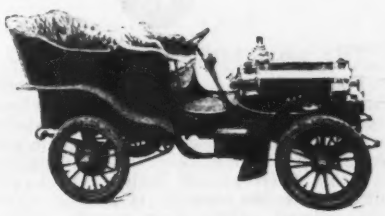
THE ELMORE TONNEAU.

Double cylinder, 12-h.p., water cooled, horizontal, 2-cycle motor in front; 3 speeds and reverse; angle-iron frame; artillery wheels; wheelbase, 77 inches; standard tread; gasoline capacity, 10 gallons; water, 3 gallons; weight, 1,500 pounds; seats 4 persons; price, $1,400.—Elmore Mfg. Co., Clyde, Ohio.



PEERLESS 24-H.P. MODEL.

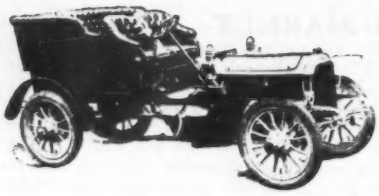
Four cylinder, 24-h.p., water cooled, vertical engine in front; force-feed lubrication; sliding speed gears and bevel-gear transmission; 3 speeds and reverse; channel-steel frame; 34-inch artillery wheels and 4-inch tires; weight, 1,850 pounds; seats 5 persons; price, $4,000.—The Peerless Motor Car Co., Cleveland, Ohio.



THE THOMAS

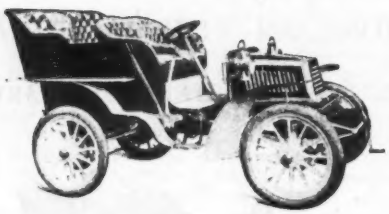
Three cylinder, 24-h.p., water cooled, vertical motor in front; cellular radiator; planetary transmission gears; 2 speeds and reverse; steel frame and artillery wheels; wheelbase, 84 inches; tread, 54 inches; gasoline capacity, 15 gallons; water, 5 gallons; weight, 1,900 pounds; seats 5 persons; price, $2,500. The 8-h.p. model has horizontal motor, and sells for $1,250.—E. R. Thomas Motor Co., Buffalo, N. Y.

Gasoline Carriages.



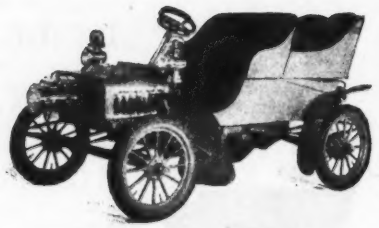
PEERLESS 35-H.P. MODEL.

Four cylinder, 35-h.p., water cooled, vertical engine in front; sliding speed gears, with direct connection on the high speed; bevel-gear transmission; 4 speeds and reverse; cellular radiator, with fan; channel-steel frame; 34-inch artillery wheels and 4½-inch tires; wheelbase, 162 inches; seats 6 persons; price, $6,000.—The Peerless Motor Car Co., Cleveland, Ohio.



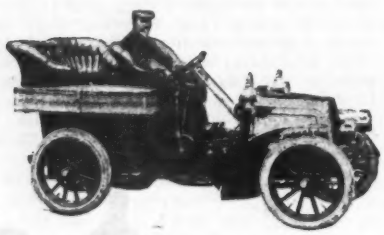
THE MODEL L RAMBLER.

Double cylinder, 14-h.p., water cooled, horizontal motor mounted amidships; 2 speeds and reverse; angle-steel frame; 30-inch artillery wheels and 3½-inch tires; wheelbase, 87 inches; standard tread; weight, 1,900 pounds; seats 5 persons; with canopy top price is $1,350.—Thos. B. Jeffery & Co., Kenosha, Wis.



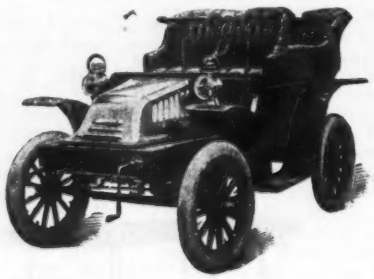
THE MODEL K RAMBLER.

Double cylinder, 14-h.p., water cooled, horizontal motor mounted amidships; angle-steel frame and full elliptic springs; 30-inch artillery wheels and 3½-inch tires; wheelbase, 87 inches; standard tread; weight, 1,500 pounds; seats 2 persons; price, $1,100; price with tonneau, $1,200.—Thos. B. Jeffery & Co., Kenosha, Wis.



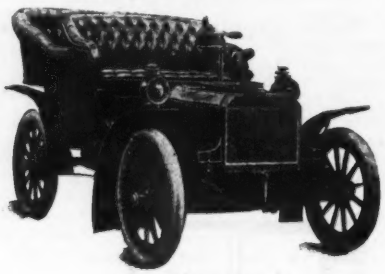
THE BERG.

Four-cylinder, 24-h.p., water cooled, vertical motor in front; sliding-gear transmission; 4 speeds and reverse; armored-wood frame and semi-elliptic springs; 34-inch artillery wheels; 4-inch tires; wheelbase, 90 inches; tread, 54 inches; seats 6 persons; price, $3,500.—Berg Automobile Co., 100 Broadway, New York.



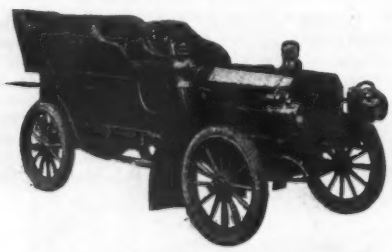
HAYNES-APPERSON 1904 TONNEAU.

Double cylinder, 17-h.p., water cooled, horizontal opposed motor in front; 3 speeds and reverse; angle-iron frame and artillery wheels; wheelbase, 80 inches; standard tread; gasoline capacity, 10 gallons; water, 10 gallons; weight, 2,300 pounds; seats 5 persons; price, $2,500. Cut shows $2,400 car; cellular radiator will be used.—The Haynes-Apperson Co., Kokomo, Ind.



THE AUTOCAR.

Double cylinder, water cooled, 11-h.p. horizontal opposed engine in front; 3 speeds forward and 1 reverse; steel and wood frame; 30-inch artillery wheels and 3-inch tires; wheelbase, 76 inches, and tread, 54 inches; gasoline capacity, 10 gallons; water, 3 gallons; weight, 1,675 pounds; seats 4 persons; price, $1,700.—The Autocar Company, Ardmore, Pa.

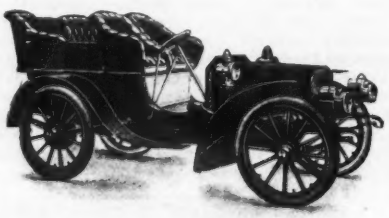


THE 1904 ELDREDGE TONNEAU.

Four cylinder, 16-h.p., water cooled, horizontal opposed motor in front; cellular radiator, with fan; throttle control; sliding speed gears; bevel-gear drive; angle-steel frame and semi-elliptic springs; artillery wheels; wheelbase, 86 inches; tread, 56½ inches; gasoline capacity, 11 gallons; water, 3½ gallons; weight, 2,300 pounds; seats 5 persons; price, $2,000.—National Sewing Machine Co. Belvidere, Ill.

THE PHELPS.

Three cylinder, 15-h.p., water cooled, vertical motor in front; 3 speeds and reverse; armored-wood frame; artillery wheels; wheelbase, 85 inches; tread, 54 inches; gasoline capacity, 10 gallons; water, 8 gallons; weight, 1,500 pounds; seats 4 persons; price, $2,000.—Phelps Motor Vehicle Co., Stoneham, Mass.



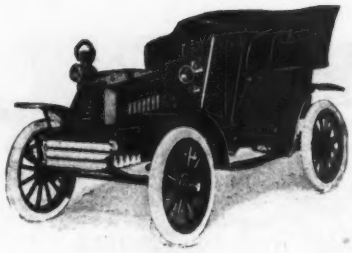
THE MATHESON.

Four cylinder, 24-h.p., water cooled, vertical engine in front; 3 speeds and reverse; steel and ash frame; 36-inch artillery wheels; 4-inch tires; wheelbase, 97 inches; standard tread; gasoline capacity, 15 gallons; water, 3 gallons; weight, about 2,500 pounds; seats 6 persons; price, $5,000.—Matheson Motor Car Co., Ltd., Grand Rapids, Mich.

A short explanation of technical terms for the uninitiated.

Gasoline automobiles generally have their engine or motor mounted vertically or horizontally, either in front, under a bonnet or hood, or "amidships," or close to the rear axle. The cylinder or cylinders are kept cool either by water or by air. Air cooling is accomplished by directing the natural draught of the moving car against the cylinders, which have cooling or radiating flanges (a fan is sometimes used to facilitate

Gasoline Carriages.



THE 1904 ST. LOUIS.

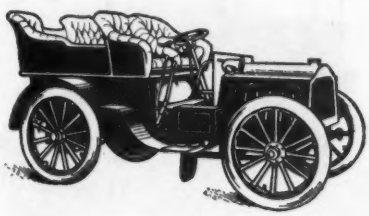
Single cylinder, 10-h.p., water cooled, horizontal engine mounted amidships; 2 speeds and reverse; angle-iron frame; 30-inch artillery wheels; 3½-inch tires; wheelbase, 82 inches; tread, 52 inches; gasoline capacity, 10 gallons; water, 6 gallons; weight, 1,650 pounds; seats 5; price, $1,500; runabout, with 9-h.p. motor, sells for $1,200.—St. Louis Motor Carriage Co., St. Louis, Mo.

THE FREDONIA TONNEAU.

Single cylinder, 10-h.p., water cooled, horizontal motor mounted amidships; planetary transmission gears; 2 speeds and reverse; channel-steel frame and full elliptic springs; 30-inch artillery wheels; 3½-inch tires; wheelbase, 87 inches; tread, 56 inches; gasoline capacity, 9 gallons; water, 3½ gallons; weight, 1,650 pounds; seats 4 persons; price, $1,250.—The Fredonia Mfg. Co., Youngstown, Ohio.

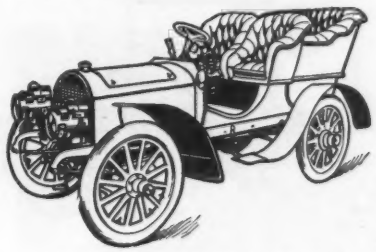
THE 1904 POPE-TOLEDO.

Four cylinder, 24-h.p., water cooled, vertical engine in front; spark and throttle control levers on steering wheel; sliding-speed gears, with direct connection on the high speed; 3 speeds and reverse; channel-steel frame; 32 and 34-inch artillery wheels, with 4-inch tires; wheelbase, 91 inches; tread, 54 inches; gasoline capacity, 14 gallons; weight, 2,350 pounds; seats 5 persons; price, $3,500.—Pope Motor Car Co., Toledo, Ohio.



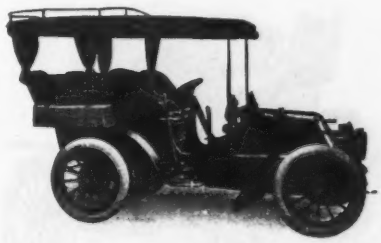
THE 1904 S. & M.

Four cylinder, 18-h.p., water cooled, vertical motor in front; honeycomb radiator and fan; 4 speeds and reverse; wood and angle-iron frame; artillery wheels; wheelbase, 90¾ inches; gasoline capacity, 25 gallons; water, 2 gallons; weight, 1,200 pounds; seats 5 persons; price, $5,500.—Smith & Mabley, 513-519 7th avenue, New York.



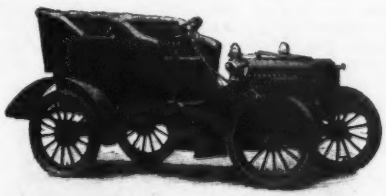
ROYAL 16-H.P. TOURIST.

Double cylinder, 16-h.p., water cooled, vertical motor in front; cellular radiator; sliding speed gears; 3 speeds and reverse; bevel-gear transmission; pressed-steel frame and 34-inch artillery wheels; wheelbase, 90 inches; standard tread; weight, 1,700 pounds; seats 5 persons; price, $2,300.—Royal Motor Car Co., Lake and Marquette streets, Cleveland, Ohio.



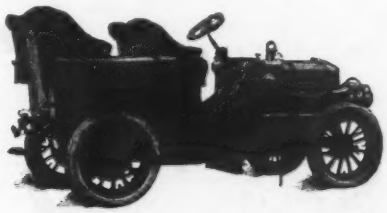
THE COLUMBIA TOURING CAR.

Four cylinder, 24-h.p., water cooled, vertical engine in front; sliding-gear transmission, with direct connection on the high speed; 4 speeds and reverse; false frame supporting engine mechanism; weight, 3,000 pounds; gasoline capacity, 12 gallons; seats 6; price, $4,500 and $5,000. A double cylinder, 12-h.p. car to sell for $1,800, will also be built.—Electric Vehicle Co., Hartford, Conn.



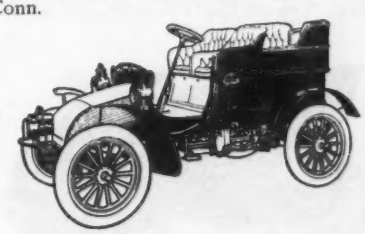
THE FOUR-CYLINDER PREMIER.

Four cylinder, 40-h.p., water cooled, vertical 4-cycle motor in front; sliding gears; 3 speeds and reverse; pressed-steel frame and semi-elliptic springs; 34-inch artillery wheels; 3-inch tires; wheelbase, 96 inches; tread, 54½ inches; gasoline capacity, 14 gallons; weight, 2,250 pounds; seats 6 persons; price, $5,000. Double cylinder, 20-h.p., 2-cycle motor model sells for $2,500.—Premier Motor Mfg. Co., Indianapolis, Ind.



THE ROBINSON.

Four cylinder, 24-h.p., water cooled, vertical motor in front; cellular radiator; sliding-gear transmission; 3 speeds and reverse; channel-steel frame; 34-inch artillery wheels and 4½-inch tires; wheelbase, 96 inches; tread, 54 inches; gasoline capacity, 20 gallons; weight, 2,600 pounds; seats 5 persons; price, $5,000.—Pope-Robinson Company, Hyde Park, Mass.

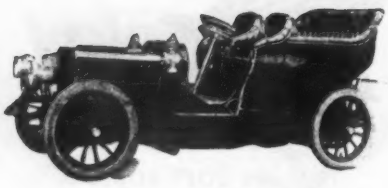


THE YALE.

Double cylinder, 16-h.p., water cooled, horizontal opposed motor mounted amidships; 2 speeds and reverse; artillery wheels and 4-inch tires; wheelbase, 88 inches; tread, 54 inches; gasoline capacity, 10 gallons; water, 6 gallons; weight, 1,800 pounds; seats 5 persons; price, $1,500. Thirty-h.p. model, with vertical motor in front and 104-inch wheelbase, sells for $2,500.—The Kirk Mfg. Co., Toledo, Ohio.

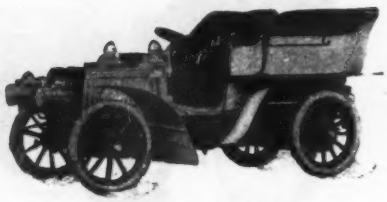
cooling). The water-cooled engine has its cylinders encased in a water jacket (water is circulated through this jacket and through a cooling radiator by a pump or natural circulation). Multiple-cylinder engines usually have the cylinders mounted vertically, in groups of two, four or six. A few have the cylinders mounted horizontally, with the piston thrust of each cylinder in the same common direction. Another plan is to have the cylinders of a horizontal engine "opposed"; that is, with the piston thrusts alternating toward each other.

Gasoline Carriages.



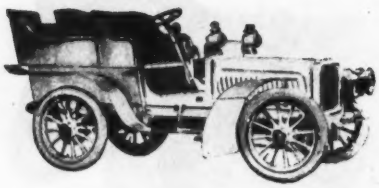
THE 1904 COMPOUND.

Three cylinder, 35-h.p., water cooled, vertical engine in front; 2 cylinders high pressure and 1 low pressure; sliding-gear transmission; 3 speeds and reverse; 36-inch artillery wheels and 5-inch tires; wheelbase, 112 inches; tread, 56½ inches; gasoline capacity, 30 gallons; water, 20 gallons; weight, 3,100 pounds; seats 7 persons; prices, $6,000 and $8,000.—The Eisenhuth Horseless Vehicle Co., Middletown, Conn.



THE 1904 PANHARD.

Four cylinder, 15, 18 or 24-h.p., water cooled, vertical engine in front; sliding-gear transmission; 4 speeds and reverse; steel and wood frame; artillery wheels; gasoline capacity, 25 to 35 gallons; seat 4 to 6 persons; price of chassis without body, $5,500, $7,250 and $8,850.—Panhard-Levassor, Paris, France. American branch, 230-232 West 13th street, New York.

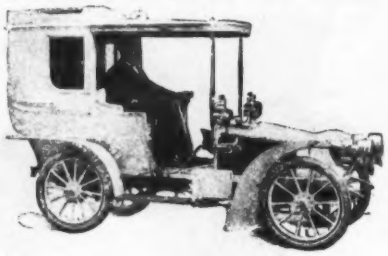


THE DECAUVILLE.

Four cylinder, 16-h.p., water cooled, vertical motor in front; cellular radiator; sliding-gear transmission, 3 speeds and reverse; pressed-steel frame; artillery wheels; wheelbase, 84 inches; tread, 54 inches; weight, 1,800 pounds; seats 5 persons; price, $6,000.—Standard Automobile Co. of New York, 39th St., New York, U. S. agent.

THE "SANTOS-DUMONT."

Double cylinder, 14-h.p., water cooled, horizontal opposed engine mounted on frame under front seats; channel-steel frame; 30-inch artillery wheels and 3½-inch tires; wheelbase, 82 inches; standard tread; weight, 1,850 pounds; seats 4 or 5 persons; price, $1,500.—The Columbus Motor Vehicle Co., Columbus, Ohio.



THE RENAULT.

Four cylinder, 16-h.p., water cooled, vertical engine in front; sliding speed gears; with direct connection on the high speed; 3 speeds and reverse; tubular and steel frame; artillery wheels; wheelbase, 98 inches; tread, 4 feet; gasoline capacity, 15 gallons; water, 5 gallons; weight, 1,900 pounds; seats 5 persons; price, $6,000.—Société Franco-Americaine d'Automobiles, 12 East 27th street, New York, U. S. agent.

FOUR CYLINDER 1904 DARRACQ.

Four cylinder, 24-h.p., water cooled, vertical motor in front; hand and automatic throttle control; cellular radiator, with fan; sliding speed gears; bevel-gear transmission; 3 speeds and reverse; channel-steel frame and artillery wheels; wheelbase, 86 inches; tread, 54 inches; weight, 2,800 pounds; seats 4 to 6 persons; price, $6,500; with top, $7,000.—American Darracq Automobile Co., 652-664 Hudson street, New York, U. S. agent.

THE 1904 DAIMLER.

Four cylinder, 20-h.p., water cooled, vertical engine in front; 4 speeds and reverse; channel-steel frame; artillery wheels; 4-inch tires; wheelbase, 96 inches; tread, 54 inches; gasoline capacity, 15 gallons; water, 5 gallons; weight, 2,600 pounds; seats 5 persons; price, $5,000. The 30-h.p. model sells for $7,500.—Daimler Mfg. Co., Long Island City, N. Y.

MORS 18-H.P. MODEL.

Four cylinder, 18-h.p., water cooled, vertical engine in front; throttle control; cellular radiator, with fan; 4 speeds and reverse; pressed-steel frame; artillery wheels; gasoline capacity, 20 gallons; water, 5 gallons; wheelbase, 101 inches; tread, 55 inches; seats 4 to 6 persons; price, $8,000; the 11-h.p. model sells for $5,000.—The Central Automobile Co., 1684 Broadway, New York, U. S. agent.

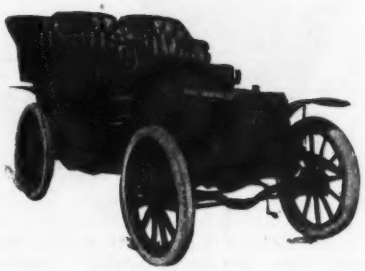
THE DE DIETRICH.

Four cylinder, 30-h.p., water cooled, vertical motor in front; 4 speeds and reverse; armored-wood frame; artillery wheels; wheelbase, 93½ inches; gasoline capacity, 22 gallons; water, 8 gallons; weight, 2,400 pounds; seats 5 persons; price, $9,700.—Automobile Exchange & Storage Co., 133-139 West 38th street, New York, U. S. agent.

Variable speed gears enable the engine to develop its full power at slow speed for hill climbing or for driving on rough or muddy roads. These gears permit from two to four different rates of speeds forward and one or more backward. The speed of the car is also controlled by engine-throttle and ignition-spark levers.

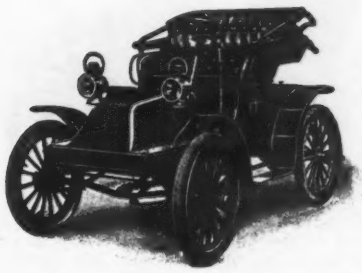
Steam automobile engines are now of the compound type, using the exhaust from one cylinder in another before exhausting it into the air. A condenser is used to condense the exhausting steam, and most of this is turned back as water into the boiler.

Gasoline Carriages.



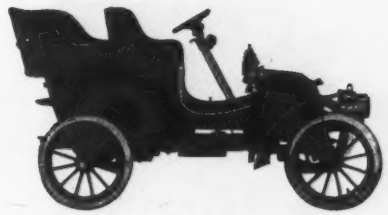
THE CLEMENT.

Four cylinder, 18-h.p., water cooled, vertical engine in front; 4 speeds and reverse; stamped-steel frame; artillery wheels; gasoline capacity, 12 gallons; water, 3 gallons; weight, 1,800 pounds; seats 5 persons; price, $5,000.—Société Franco-Americaine d'Automobiles, 12 East 27th street, New York, U. S. agent.



HAYNES-APPERSON LIGHT CAR

Double cylinder, 11-h.p., water cooled, horizontal opposed motor in rear; 3 speeds and reverse; angle-iron frame; artillery wheels; wheelbase, 75 inches; standard tread; gasoline capacity, 6 gallons; seats 2 persons; price, with top, $1,550.—The Haynes-Apperson Co., Kokomo, Ind.

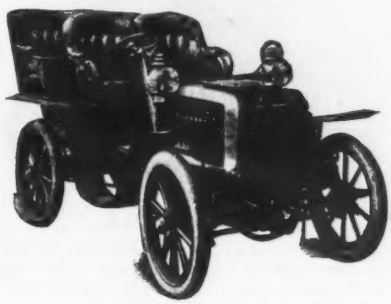


THE CREST-MOBILE.

Single cylinder, 7-h.p., air cooled, vertical motor in front; 2 forward speeds and 1 reverse; sliding-gear transmission; tubular frame; steel artillery wheels, with 2½-inch tires; wheelbase, 74 inches; tread, 54; gasoline capacity, 5 gallons; weight, 930 pounds; seats 4 persons; price, $850.—The Crest Mfg. Co., Cambridge, Mass.

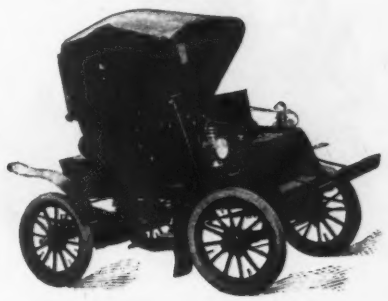
THE 1904 CUDELL.

Four cylinder, 16-h.p., air cooled, vertical motor in front; sliding speed gears; 4 speeds and reverse; bevel-gear drive; steel and wood frame; artillery wheels; gasoline capacity, 20 gallons; wheelbase, 74½ inches; tread, 54 inches; seats 5 persons; price, $4,500. Cut shows 22-h.p. car, with water-cooled engine.—Clodio & Widmayer, 10 West 33d street, New York, U. S. agent.



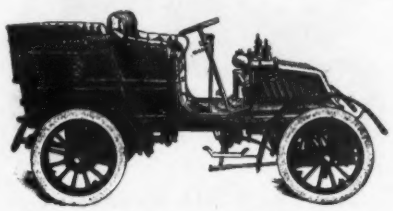
TWO CYLINDER 1904 DARRACQ

Double cylinder, 12-h.p., water cooled, vertical motor in front; 3 speeds and reverse; steel and wood frame; semi-elliptic springs; artillery wheels; wheelbase, 77 inches; tread, 50½ inches; gasoline capacity, 5 gallons; water, 5 gallons; weight, 2,000 pounds; seats 4 or 5 persons; price, $3,500.—American Darracq Automobile Co., 652-664 Hudson street, New York, U. S. agent.



PIERCE STANHOPE.

Single cylinder, water cooled, 8-h.p., vertical motor on rear axle; 2 forward speeds; tubular frame and full elliptic springs; 28-inch wood wheels and 3-inch tires; wheelbase, 70 inches, and standard tread; gasoline capacity, 5 gallons; water, 6 gallons; weight, about 1,200 pounds; seats 2; price, $1,200.—George N. Pierce Co., Buffalo, N. Y.

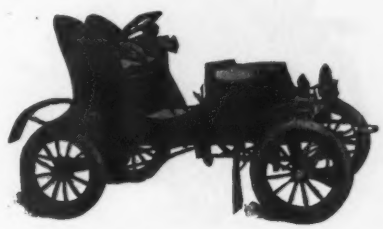


DE DION-BOUTON TONNEAU.

One, two or four cylinder, water cooled, vertical engine, of from 3½ to 25-h.p. in front; 2 or 3 speeds; tubular frame; wire or artillery wheels; wheelbase, 6 to 7 feet; tread, 52 inches; gasoline capacity, 6 to 15 gallons; water, same; seats 2 or 4 persons; price $1,200 to $3,000.—K. A. Skinner, 179 Clarendon street, Boston, U. S. agent.

THE ROCHET-SCHNEIDER.

Four cylinder, 20-h.p., water cooled, vertical motor in front; 4 speeds and reverse; wheelbase, 94 inches; tread, 54 inches; gasoline capacity, 21 gallons; water, 3 gallons; weight, 2,500 pounds; seats 5 or 7 persons; price, $7,500.—Alexander Fischer, 239 West 50th street, New York, U. S. agent.



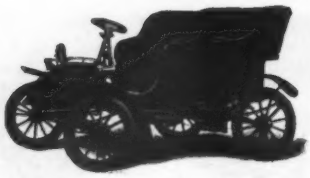
THE FRANKLIN.

Four cylinder, 10-h.p., air cooled, vertical engine in front; no fan; 2 speeds and reverse; steel frame and 28-inch artillery wheels; wheelbase, 72 inches; tread, 54 inches; gasoline capacity, 7 gallons; weight, 1,100 pounds; seats 2 persons; price, $1,300.—H. H. Franklin Mfg. Co., Syracuse, N. Y.

The frame or "chassis" is constructed either wholly of channel or angle iron or steel or of wood and iron. Wheels are in most cases of the "artillery" type, of wood or tubular steel; wire wheels, of the suspension type, are used on some of the lighter cars.

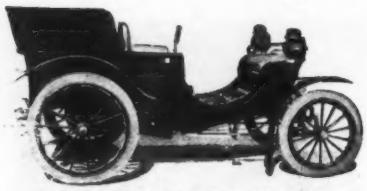
The wheelbase of a car is the distance between the axles, and the tread the distance between the wheels on one side of the car and those on the other side. A long wheelbase insures an easy riding vehicle.

Gasoline Carriages.



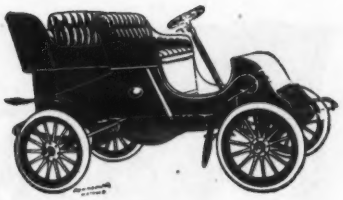
ELMORE CONVERTIBLE RUNABOUT.

Single cylinder, 6½-h.p., water cooled, horizontal, 2-cycle motor on center of frame, 2 speeds and reverse; wheelbase, 68 inches; standard tread; gasoline capacity, 7 gallons; water, 3 gallons; weight, 1,050 pounds; seats 2 or 4 persons; price, $650.—Elmore Mfg. Co., Clyde, Ohio.



THE DURYEA TONNEAU.

Three cylinder, 12-h.p., water cooled, inclined motor under center of body; planetary-speed gears; 2 speeds and reverse; armored-wood frame; artillery wheels; 3½-inch tires; wheelbase, 92 inches; standard tread, gasoline capacity, 10 gallons; water, 15 gallons; weight, 1,350 pounds; seats 5 or 7 persons; price, $1,750.—Duryea Power Co., Reading, Pa.

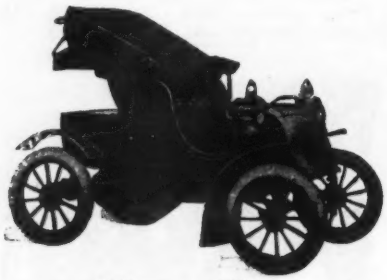


THE CADILLAC.

Single cylinder, 6-h.p., water cooled, horizontal motor mounted amidships; planetary gears; 2 speeds and reverse; angle-steel frame; semi-elliptic springs; 28-inch artillery wheels and 3-inch tires; seats 2 persons; price, $750; with tonneau, $850.—Cadillac Automobile Co., Detroit, Mich.

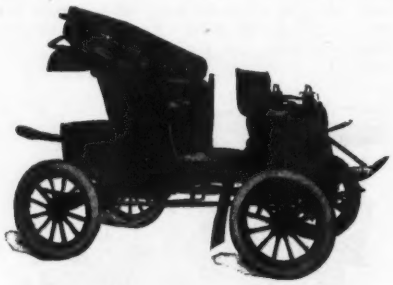
THE FORD.

Double cylinder, 8-h.p., water cooled, horizontal opposed engine mounted amidships; 3 speeds and reverse; wheelbase, 72 inches; standard tread; gasoline capacity, 5½ gallons; water, 1½ gallons; weight, 1,240 pounds; seats 2 persons; price, $750. Price, with tonneau, $850.—Ford Motor Co., Detroit, Mich.



THE 1904 KNOX.

Single cylinder, 8-h.p., horizontal, air-cooled motor on center of frame; planetary transmission gears; 2 speeds and reverse; angle-iron frame and side springs; 30-inch artillery wheels; 3½-inch tires; wheelbase, 78 inches; tread, 54 inches; gasoline capacity, 10 gallons; weight, 1,850 pounds; price, $1,350. Double cylinder, 16-h.p. car, $2,000.—Knox Automobile Co., Springfield, Mass.

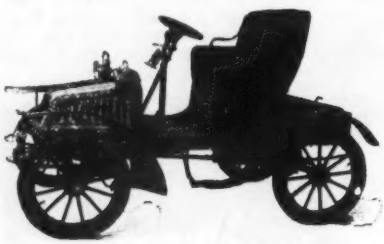


THE STEVENS-DURYEA.

Double cylinder, 7-h.p., water cooled, horizontal motor under seat; 3 speeds and reverse; tubular frame and full elliptic springs; 28-inch artillery wheels and 3-inch tires; wheelbase, 69 inches; tread, 54 inches; gasoline capacity, 6 gallons; water, 5 gallons; weight, 1,300 pounds; seats 2 or 4 persons; price, $1,300.—J. Stevens Arms and Tool Co., Chicopee Falls, Mass.

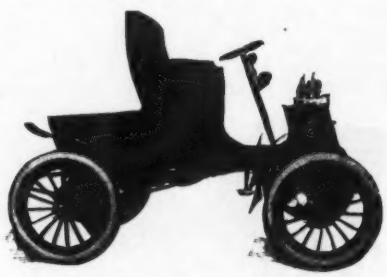
DURYEA STRAIGHT-LINE PHAETON.

Three cylinder, 12-h.p., water cooled, inclined motor under seat; wood and iron frame; artillery wheels and 3-inch tires; wheelbase, 72 inches; standard tread; gasoline capacity, 8 gallons; water, 8 gallons; weight, 950 pounds; price, $1,350.—Duryea Power Co., Reading, Pa.



THE 1904 COVERT.

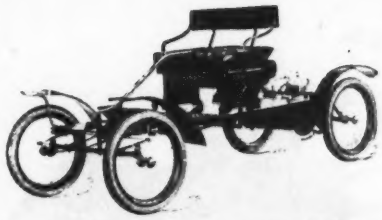
Single cylinder, 6-h.p., water cooled, vertical motor in front; sliding speed gears; 2 speeds and reverse; bevel-gear transmission; angle-iron frame; artillery wheels; wheelbase, 68 inches; tread, 54 inches; gasoline capacity, 5 gallons; water, 4 gallons; weight, 750 pounds; seats 2 persons; price, $750.—B. V. Covert & Co., Lockport, N. Y.



THE FREDONIA RUNABOUT.

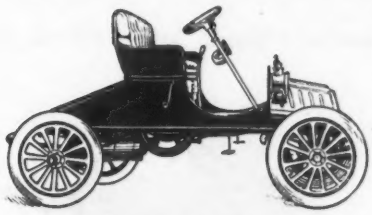
Single cylinder, 9-h.p., water cooled, horizontal motor on center of frame; planetary gears; channel-steel frame; full elliptic springs; 30-inch artillery wheels; 3-inch tires; gasoline capacity, 8 gallons; water, 3½ gallons; wheelbase, 84 inches; standard tread; weight, 1,300 pounds; seats 2 persons; price, $1,000.—The Fredonia Mfg. Co., Youngstown, Ohio.

CARBURETER—A gasifier or mixing valve for mixing gasoline and air into an explosive gas. **MUFFLER.**—An arrangement for deadening the noise of the exhaust of an explosion, or internal combustion motor. **GARAGE.**—A storage and repair station **SPARK PLUG.**—The instrument which ignites the gas in the engine cylinder causing the explosions that supply the power. **SPARK COIL.**—A coil of wire, wound after certain principles and thoroughly insulated, to increase the energy of the electric current which causes the spark in the cylinder. **TONNEAU.**—A style of rear seat construction peculiar to automobile bodies.



THE 1904 ORIENT BUCKBOARD.

Single cylinder, air cooled, 4-h.p., vertical motor mounted on rear axle; 2 speeds; buckboard frame, with 2 full elliptic springs in front; 26-inch wire wheels and 2½-inch single tube tires; gasoline capacity, 100 miles; weight, about 500 pounds; seats 2 persons; price, $425.—Waltham Mfg. Co., Waltham, Mass.

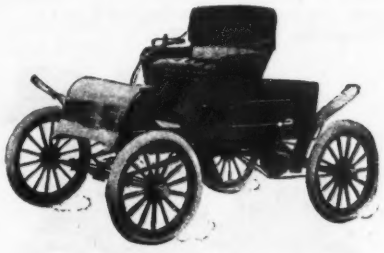


THE 1904 AUBURN.

Single cylinder, 10-h.p., water cooled, horizontal motor amidships; planetary transmission gears; 2 speeds and reverse; angle-steel frame and half-elliptic springs; artillery wheels; body has detachable tonneau; wheelbase, 78 inches; standard tread; gasoline capacity, 9 gallons; weight, 1,500 pounds; seats 2 or 4 persons; price, $1,000.—Auburn Automobile Co., Auburn, Ind.

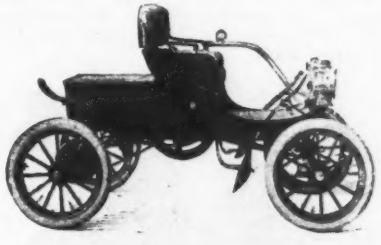
THE HOLLEY.

Single cylinder, 5-h.p., water cooled, vertical motor in front; planetary transmission gears; wheelbase, 58 inches; tread, 47 inches; gasoline capacity, 3½ gallons; water, 2 gallons; weight, 850 pounds; seats 2 persons; price, $650.—Holley Motor Car Co., Bradford, Pa.



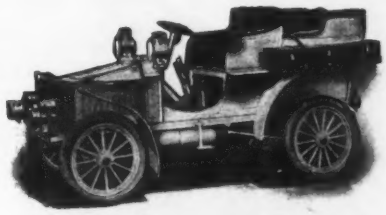
THE NORTHERN.

Single cylinder, 6-h.p., water cooled, horizontal motor on center of frame; 2 speeds and reverse; tubular frame and Concord springs; 28-inch artillery wheels; wheelbase, 70 inches; standard tread; gasoline capacity, 8 gallons; water, 4 gallons; weight, 950 pounds; seats 2 persons; price, $750.—Northern Mfg. Co., Detroit, Mich.



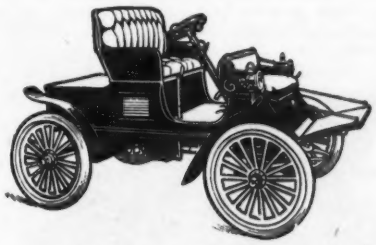
THE OLDSMOBILE.

Single cylinder, 4-h.p., water cooled, horizontal motor on center of frame; sliding speed gears; 3 speeds and reverse; Concord springs; 28-inch artillery wheels and 2½-inch tires; wheelbase, 72 inches; standard tread; gasoline capacity, 4 gallons; water, 2 gallons; weight, 850 pounds; seats 2 persons; price, $650.—Olds Motor Works, Detroit, Mich.



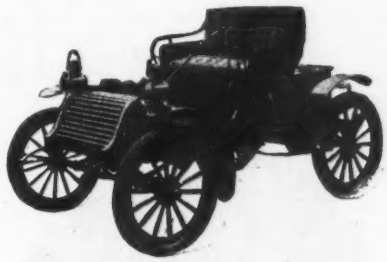
WHITE 1904 MODEL.

Double cylinder, 10-h.p., vertical compound steam engine in front; steam condensed; throttle control; steel frame; bevel-gear transmission; 30-inch artillery wheels and 4-inch tires; wheelbase, 80 inches; tread, 56 inches; gasoline capacity, 10 gallons; water, 15 gallons; weight, 1,650 pounds; seats 4 persons; price, $2,500.—White Sewing Machine Co., Cleveland, Ohio.



THE 1904 NIAGARA.

Single cylinder, 5-h.p., water cooled, vertical motor in rear; sliding speed gears on axle; 2 speeds and reverse; steel and wood frame; full elliptic springs in rear, semi-elliptic in front; 30-inch artillery wheels, with 3-inch tires; wheelbase, 70 inches; standard tread; gasoline capacity, 5 gallons; weight, 1,100 pounds; seats 2 or 4 persons; price, $850.—Wilson Automobile Mfg. Co., Wilson, Niagara Co., N. Y.



THE 1904 ELDREDGE RUNABOUT.

Double cylinder, 8-h.p., water cooled, horizontal opposed motor on center of frame; 3 speeds and reverse; armored-wood frame and platform springs; 30-inch artillery wheels and 3-inch tires; wheelbase, 66 inches; tread, 56½ inches; gasoline capacity, 6 gallons; water, 6 gallons; weight, 1,150 pounds; seats 2 persons; price, $750.—National Sewing Machine Co., Belvidere, Ill.

LOCOMOBILE RUNABOUT.

Double cylinder, compound steam engine under seat, armored-wood frame; wheelbase, 75 inches; tread, 54 inches; water capacity, 32 gallons; gasoline, 14 gallons; seats 2 persons; price, $850.—The Locomobile Co. of America, Bridgeport, Conn.

The SANDUSKY

The Business Man's Friend
Always Ready to Go

A Neat, Light Runabout built for American roads. Mud, Sand and Hills shrink before it.

A model of simplicity, Quiet, Safe, Powerful and Economical. The carriage we build has been on the road for Three Years, and therefore is no experiment. We are now prepared to put them on the market, and respectfully invite your correspondence.

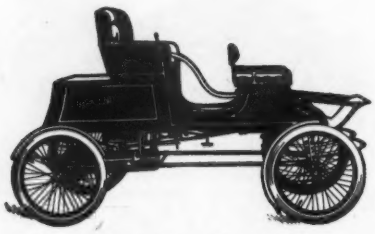
Agents wanted. Write for prices and special proposition.

THE SANDUSKY AUTOMOBILE CO.
Sandusky, Ohio, U. S. A.

Gasoline Steam and Electric Carriages.

THE SANDUSKY.

Single cylinder, 7-h.p., water cooled, horizontal motor on center of frame; sliding-gear transmission; 2 speeds and reverse; angle-iron frame and Concord springs; artillery wheels; wheelbase, 72 inches; standard tread; gasoline capacity, 5 gallons; water, 4 gallons; weight, 1,000 pounds; seats 2 persons; price, $650.—Sandusky Automobile Co., Sandusky, Ohio.

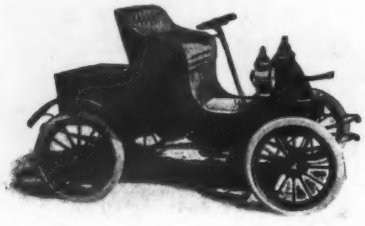


STANLEY RUNABOUT.

Double cylinder, compound horizontal steam engine, rear end on rear axle and front end, suspended from body of car; water capacity, 20 gallons; gasoline, 13 gallons; wheelbase, 78 inches; tread, 52 inches; weight, 720 pounds; seats 2 or 4 persons; price, $670.—Stanley Motor Carriage Co., Newton, Mass.

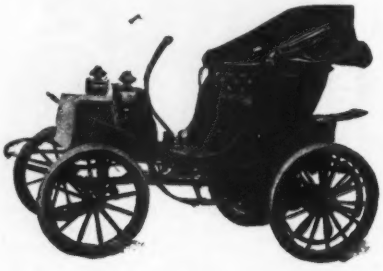
POPE-WAVERLEY CHELSEA.

Single, 3-h.p., electric motor on rear axle; 30-cell battery; herring-bone gears; 30-inch artillery wheels and 3-inch tires; wheelbase, 80 inches; tread, 54 inches; seats 2 persons; price, $1,100. Stanhope sells for $1,400.—Pope Motor Car Co., Indianapolis, Ind.



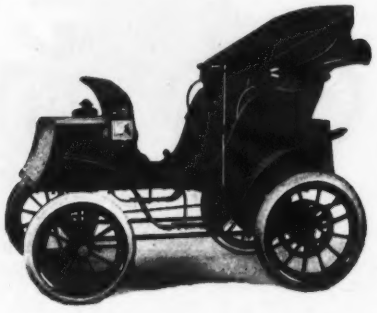
THE ELMORE RUNABOUT.

Double cylinder, 8-h.p., water cooled, vertical 2-cycle motor on center of frame; 3 speeds and reverse; angle-iron frame; artillery wheels; wheelbase, 68 inches; standard tread; gasoline capacity, 7 gallons; water, 3 gallons; weight, 1,400 pounds; seats 2 persons; price, $800.—Elmore Mfg. Co., Clyde, Ohio.



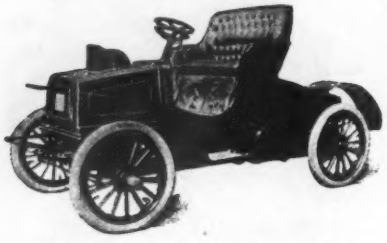
WOODS 1904 VICTORIA.

Two 2½-h.p. electric motors mounted on rear axle; 40-cell battery divided in body; 4 speeds; maximum, 18 miles an hour; wheelbase, 70 inches; standard tread; weight, 2,700 pounds; seats 2 persons; price, $1,900. Broughams, coupés, landaus and landaulettes, from $2,100 to $3,500. —Woods Motor Vehicle Co., 110 East 20th street, Chicago, Ill.



COLUMBIA VICTORIA.

Two electric motors on rear axle; battery divided in body; "herring-bone" gears; maximum speed, 13 miles an hour; 32-inch artillery wheels and 3½-inch tires; price, $1,600.—Electric Vehicle Co., Hartford, Conn.



THE GROUT TOURING CAR.

Double cylinder, 12-h.p., horizontal steam engine just forward of center of frame; boiler under bonnet; 30-inch artillery wheels; water capacity, 40 gallons; gasoline capacity, 15 gallons; wheelbase, 86 inches; tread, 56 inches; weight, 2,200 pounds; with tonneau, seats 5 persons; price, $2,000.—Grout Bros., Orange, Mass.

POPE-WAVERLEY TONNEAU.

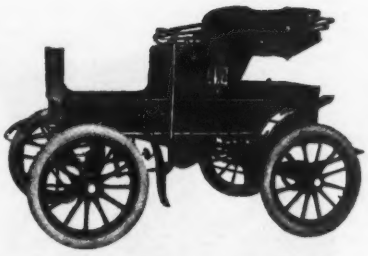
Two 3-h.p. electric motors, with total overload capacity of 12-h.p. on rear axle; 40-cell battery under body; herring-bone transmission gears; speed, 5 to 15 miles an hour; armored-wood frame and full elliptic springs; 30-inch artillery wheels and 3½-inch tires; wheelbase, 84 inches; tread, 54 inches; seats 5 persons; price, $1,800.—Pope Motor Car Co., Indianapolis, Ind.

NATIONAL TONNEAU.

Single electric motor, 6-pole type, with 9-h.p. overload capacity mounted on rear axle; "herring-bone" gears; 4 speeds; 5 to 15 miles an hour; battery divided under hood and tonneau seat; armored-wood frame; price, $2,000. Other models are runabout, $950; special runabout, $1,200; trap, $1,250, and stanhope, $1,500.—National Motor Vehicle Co., Indianapolis, Ind.

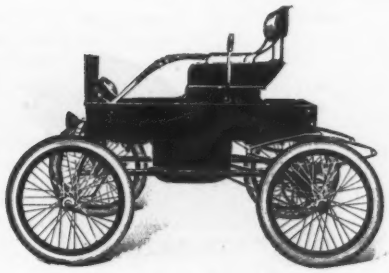
The eighty-eight cuts and descriptions of motor vehicles which we have gathered together in the preceding list will give our readers an accurate idea of what the markets provide and of what is the most practical machine for them to buy. That any industry can offer a catalogue of this size and variety, of a product which fifteen years ago was almost unheard of in this country, is a most remarkable record. If the motor vehicle industry continues to grow in the future as it has in the past few years, it will not be long

Electric Carriages.



THE STUDEBAKER RUNABOUT.

Single, 2 to 4-h.p., electric motor on center of frame; 24-cell exide battery; wheelbase, 61 inches; tread, 54 inches; weight, 1,450 pounds; seats 2 persons; price, without top, $975.—Studebaker Bros. Co. of New York, 7th avenue and 48th street, New York.

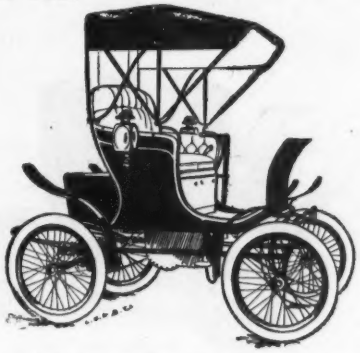


THE BAKER RUNABOUT.

Single, ¾-h.p., multi-polar electric motor under center of body; 12-cell battery; armored-wood frame; wheelbase, 58 inches; tread, 52 inches; weight, 650 pounds; seats 2 persons; price, $850.—The Baker Motor Vehicle Co., Cleveland, Ohio.

POPE-WAVERLEY ROAD WAGON.

Single, 3-h.p., electric motor on rear axle; 24-cell battery; herring-bone transmission; speed, 5 to 15 miles an hour; wheelbase, 61 inches; tread, 54 inches; seats 2 persons; price, $850; with top, $900; physician's model, price, $850.—Pope Motor Car Co., Indianapolis, Ind.



THE BAKER STANHOPE.

Single, 1¾-h.p., multi-polar electric motor mounted centrally under body; 12-cell battery; 3 speeds; maximum, 14 miles an hour; armored-wood frame; wheelbase, 64½ inches; tread, 52 inches; weight, 950 pounds; seats 2 persons; price, $1,600.—The Baker Motor Vehicle Co., Cleveland, Ohio.

THE STUDEBAKER STANHOPE.

Single, 2 to 4-h.p., electric motor center of frame; 24-cell exide battery; tubular frame; wheelbase, 61 inches; tread, 54 inches; weight, 1,560 pounds; seats 2 persons; price, with top, $1,175.—Studebaker Bros. Co. of New York, New York.

THE WOODS 1904 STANHOPE.

Two 2½-h.p. electric motors on rear axle and directly geared to road wheels; 40-cell battery in body; weight, 2,650 pounds; seats 2 persons; price, $1,800. Single motor runabout, $950.—Woods Motor Vehicle Co., 110 East 20th street, Chicago, Ill.

BUFFALO 1904 TONNEAU.

Two electric motors, 5-h.p. each, mounted on rear axle; 40-cell pasted plate battery; wheelbase, 84 inches; standard tread; weight, 3,600 pounds; seats 4 persons; price, $5,000.—Buffalo Electric Carriage Co., Buffalo, N. Y.

COLUMBIA SURREY.

Two electric motors on rear axle; exide battery, divided under seats; maximum speed, 13 miles an hour; 32-inch artillery wheels and 3½-inch tires; seats 4 persons; price, $1,500.—Electric Vehicle Co., Hartford, Conn.

BUFFALO 1904 GOLF BRAKE.

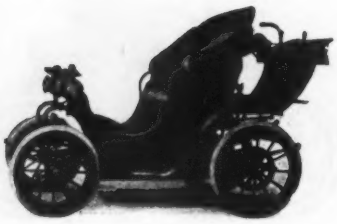
Two 2½-h.p. electric motors on frame in rear; pasted plate battery; wheelbase, 66 inches; standard tread; weight, 2,200 pounds; seats 6 persons; price, $2,200.—Buffalo Electric Carriage Co., Buffalo, N. Y.

before the prophecies of the automobile enthusiasts will be realized. The public is always cautious about trusting their safety to any new method of transportation. What we have tried to show to our readers is that the motor vehicle method of transportation is no longer in the experimental stage; that it has come to stay and has reached the point where conservative people are justified in making use of automobiles as a practical means of adding to the pleasure and ease of their existence.

Electric Carriages.

COLUMBIA RUNABOUT.

Electric motor and battery mounted amidships on frame; exide battery; Concord springs; 30-inch artillery wheels and 3-inch tires; price, $750. A new model runabout for 1904; will sell for $800.—Electric Vehicle Co., Hartford, Conn.



COLUMBIA VICTORIA PHAETON.

Two electric motors in rear; underslung battery; herring-bone gears; maximum speed 13 miles an hour; long wheelbase; artillery type wheels and solid tires; price, $3,000.—Electric Vehicle Co., Hartford, Conn.

COLUMBIA HANSOM.

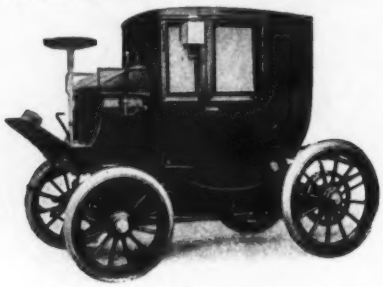
Two electric motors in rear; underslung battery; herring-bone gears; maximum speed 13 miles an hour; long wheelbase; artillery type wheels and solid tires; seats 3 persons; price, $3,500.—Electric Vehicle Co., Hartford, Conn.

BUFFALO 1904 STANHOPE.

Single, 2½-h.p., electric motor on frame; pasted plate battery in body; wheelbase, 66 inches; standard tread; weight, 1,800 pounds; seats 2 persons; price, $1,650.—Buffalo Electric Carriage Co., Buffalo, N. Y.

COLUMBIA COUPE.

Two electric motors in rear; underslung battery; herring-bone gears; interior trimming dark green morocco; long wheelbase; equipped especially for ladies' use; price, $3,500.—Electric Vehicle Co., Hartford, Conn.



COLUMBIA BROUGHAM.

Two electric motors in rear; underslung battery; herring-bone gears; interior trimming dark green morocco; extension front pattern; long wheelbase; artillery type wheels and solid tires; seats 4 persons inside; price, $3,500.—Electric Vehicle Co., Hartford, Conn.

POPE-WAVERLEY EDISON BATTERY WAGON.

Single, 60-volt, ball-bearing motor on rear axle; 48-cell Edison battery; herring-bone transmission gears; wheelbase, 103 inches; tread, 54 inches; seats 2 persons; price, $2,250.—Pope Motor Car Co., Indianapolis, Ind.

"How quickly could you stop if necessary?"

"About like that."

REPORT OF THE CLUB FIELD MEET AT GENERAL MOTORS

The General Motors Company were hosts to The Horseless Carriage Club at the November 17th Field Day, held at their plant in Southgate. Henry L. Clark, Plant Manager, had all arrangements well worked out in advance to entertain the members, and in such a setting, the HCC enjoyed a fine get together. T. G. Tomkins, Car Distribution Manager, looked after the arrangements; P. L. Armstrong, in charge of plant protection, had guides to take the various parties through the plant; F. G. Bigsby, Plant Photographer, took numerous photos of the interesting old-time cars brought to the meet by the members. The cafeteria did a big business at lunch time. This time rain did not interfere with the meet at GMC as it did in 1939.

Alfred S. Lewerenz, past president of the HCC was Chairman for the day, and a large share of the credit for the successful meeting was due to the well worked out plans he made in conjunction with Mr. Clark at their numerous conferences.

Members commenced to arrive around 9:30 and as each member entered the gate with his car he registered with Louis Combs, and then was assigned parking place by one of the Plant Protection men. Forty five cars in all were brought to the meet, the oldest being a 1904 Cadillac and the youngest was a 1932 Stutz.

The events started off promptly at 10:00 A. M. with Al Lewerenz in the starter's box to keep the contestants coming up the starting line for the various contests. He probably developed a bad case of ear ache as he had to sit in front of the loud speaker all day while announcements of the events were broadcast and musical selections played in between. The contests and winners were as follows:

10:00 - 11:00 A. M.

Starting Contest - Phillip Hill in 1918 Packard 12.

Lancing Contest - Joe Berger in 1915 Ford touring.

Tray Carrying - McPartry in 1910 Ford roadster.

11:00 - 11:45 A. M.

Inspection and photographing of old cars.

11:45 - 12:45 A. M. Refueling - Lunch

12:45 - 1:45 P. M. General Motors Hour

1:45 - 2:30 P. M.

Teeter-Totter Contest - Joe Berger in 1915 Ford touring

2:30 - 3:30 P. M.

Awards for contest winners, cars, and costumes

3:30 - 4:00 P. M.

Grand Parade - led by the winning cars

The Judges selected the following cars as outstanding examples from the forty-five machines brought to the meeting. The letters "BC" after the name of the car (not the owner) means "Best Condition". Certificates of Merit will be awarded the owners, or so at least the Secretary says.

Credit is due to the following Committee members for their invaluable help in making the meet a success: Chairman for the Day - Alfred S. Lewerenz. Morning Events - Eastwood brothers and Bernard Rademacher, with Wilbur D. Moffet as announcer at the microphone. Afternoon Events - Lindley Bothwell, who ran the teeter-totter contest until called off. Wilbur D. Moffet continued as announcer. Judges, Cars and Costumes - Art Twohy, Everett Miller, and Ben Sharpsteen. Gate Admission and Registration - Lewis B. Combs plus the company police with F. L. Reichert. In charge of Music and Loud Speaker - Albert Brouse. Lunch and Refreshment arrangements - Albert J. Dunkel. General Motors Hour - T. G. Tomkins, Mgr., Car Distribution for General Motors. Liaison with General Motors - Alfred S. Lewerenz. Arrangements of Space and Materials - Bob Bruns and Bernard Rademacher. Arrangements for parking old and new cars — W. and P. Eastwood, and company police. Publicity and Announcements - Ben Sharpsteen.

YEAR	CAR	OWNER	
1904	Cadillac	Frank L. Reichert	BC
1904	Holsman	Albert Brouse	
1905	Mercedes	Lindley Bothwell	BC
1906	Cadillac	Richard Teague	BC
1906	Oldsmobile	Herbert Briggs	BC
1906	Reo	John Carra, Jr.	BC
1907	Brush	Franklin Thompson	
1909	Buick	Harry Johnson	BC
1910	Cadillac	Chas. E. Patterson	
1910	EMF	E. Ankirderean	
1910	Ford	Harry Johnson	BC
1910	Franklin	W. A. Hames	
1910	Hupmobile	D. W. Eastwood	BC
1910	Warren-Detroit	M. H. Williams	
1911	Cadillac	Phil Brinckerhoff	
1911	Marmon	Herbert Royston	CB
1911	Maxwell	Bernard Rademacher	
1912	EMF	Fred Buess, Jr.	BC
1912	Flanders	Floyd Clymer	
1913	Buick	Louis Combs	
1913	Cadillac	Frank Kane	BC
1913	Fiat-Portola	Herbert Prentice	
1913	Woods-Mobilette	Bernard Rademacher	
1914	Ford	Tom Sharpsteen	
1914	Ford	Stanley Swope	
1914	Reo	Robert Lingo	
1914	Reo	David Slak	
1915	Dodge	Auldin Nolan	
1915	Ford	Joseph Berger	
1917	Buick	E. Nordberg	
1917	Empire	August Behron	BC
1918	Packard	Phil T. Hill, Jr.	BC
1918	Pierce-Arrow	Art Austria	
1920	Locomobile	Ransom Matthews	
1920	Templar	L. Hoyle	
1922	Ford fire truck	W. Brown	
1923	Franklin	J. E. Goldsteen	
1924	Buick	Lindley Bothwell, Jr.	BC
1924	Franklin	Earl Jones	
1925	Doble (steam)	C. J. Brian	
1929	Franklin	O. J. Zahn	
1930	Cadillac	Phil Brinkerhoff	
1930	Cord	Ray Nelson	
1932	Franklin	Lloyd Lanterman	
1932	Stutz	H. Tuttle	

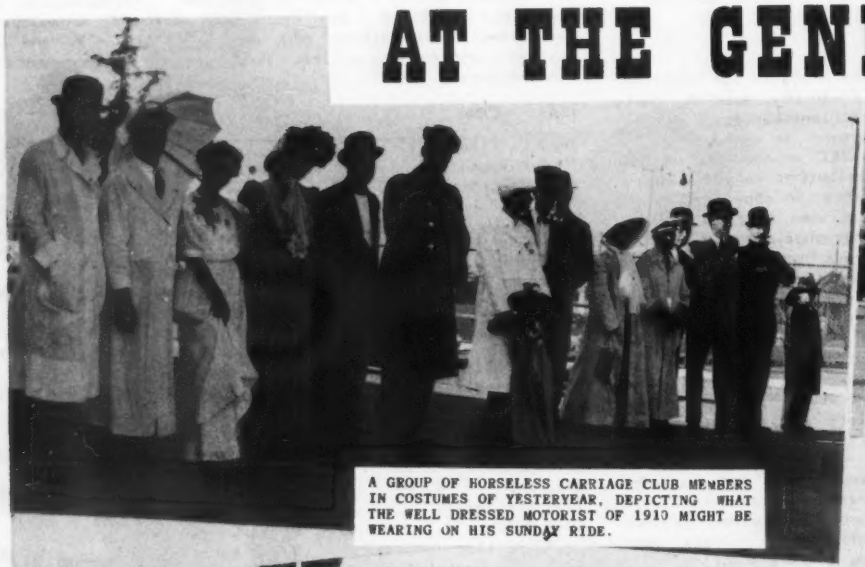
See Photos of Meet on following pages

FOR SALE

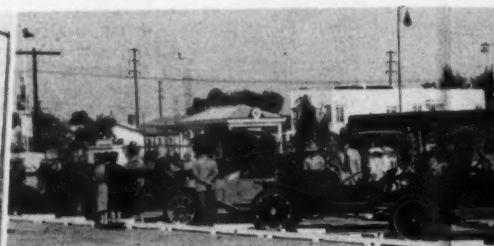
First World War Army Vehicles - Studio rental stock. 31 vehicles consisting of: 6 Liberty Trucks; 5 FWD trucks, 1 Nash Quad; 1 2½-ton GMC; 2 1-ton GMC pickups; 2 Whippet tanks; 9 GMC Ambulances; 1 White reconnaisance car; 2 1918 Cadillac Staff cars; 1 1923 Renault touring, and 1 1912 Renault truck. Also large stock of parts and tires for this equipment. All are in excellent mechanical condition, and recently painted. This is the only stock of such equipment in existence. No competition in the Motion Picture rental field. For sale in one lot for less than two weeks rental. Owner retiring from business. Colonel M. C. Bradley, 233 W. Orange Grove Av., Burbank, Calif. CHarleston-6 3826.

Rolls-Royce 1932 American Brewster touring sedan, about the cleanest one in the country, fine tires, etc. 1924 Kissel Goldbug speedster, like new, very rare vintage car. 1921 Stutz Bearcat, needs work. Also other Foreign, luxury, and Antique cars, what are your wants? Horns such as Klaxon, Sparton, and French bulb type, also lamps, etc. New weather vanes for your garage depicting an antique auto. Write C. A. Gaines, 2429 W. Fond du Lac Av., Milwaukee, Wisc.

AT THE GENERAL MOTOR

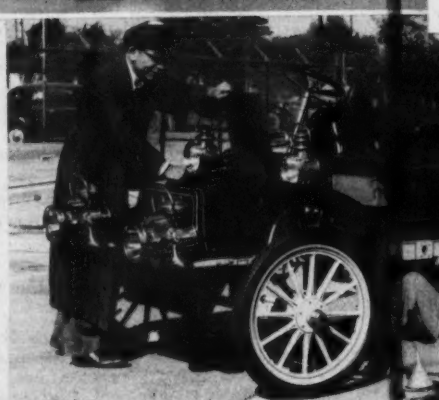


A GROUP OF HORSELESS CARRIAGE CLUB MEMBERS IN COSTUMES OF YESTERYEAR, DEPICTING WHAT THE WELL DRESSED MOTORIST OF 1910 MIGHT BE WEARING ON HIS SUNDAY RIDE.



LINED UP FOR INSPECTION ARE, LEFT TO RIGHT, A 19 OWNED BY STANLEY SWOPE; PHILLIP HILL'S 18 TWIN SIX TOWN CAR; A 1909 HUPMOBILE, BELONGING EASTWOOD BROTHERS; HERBERT ROYSTON'S RACY 1911 SPEEDSTER; LOUIS COMBS'S 1913 BUICK TOURING AND BROUSE'S 1910 HOLSMAN HIGH WHEELED BUGGY.

PHILLIP HILL STARTS TO RUSH TOWARD THE WHEEL OF HIS 1918 PACKARD 12 TOWN CAR, WHILE HARRY JOHNSON CRANKS UP HIS 1910 FORD ROADSTER AND MR. RADAMACHER JUNIOR STARTS HIS 1913 WOODS-MOBILETTE. THE EVENT WAS A STARTING CONTEST WON BY THE PACKARD.



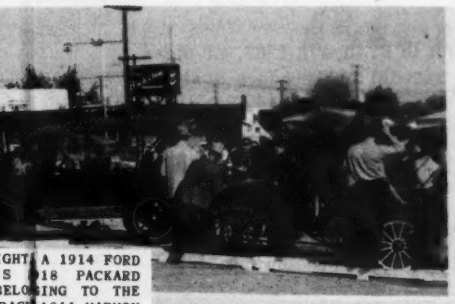
ART TWOHY AT THE WHEEL OF A 1905 AMERICAN MERCEDES TOURING, OWNED BY LINDLEY BOTHWELL. THIS CAR WAS MADE BY THE MANUFACTURERS OF THE STEINWAY PIANO, IS UPHOLSTERED IN RED LEATHER, AND CAME EQUIPPED WITH A 100 M. P. H. SPEEDOMETER.

INCLUDED IN THIS IMPRESSIVE GR OF AN A 1917 BUICK OWNED BY E. NORDB LOUIS BUICK OWNED BY HARRY JOHNSON, BERT OLDSMOBILE, AND DICK TEAGUE'S CADI

ORS MEET, NOVEMBER 17

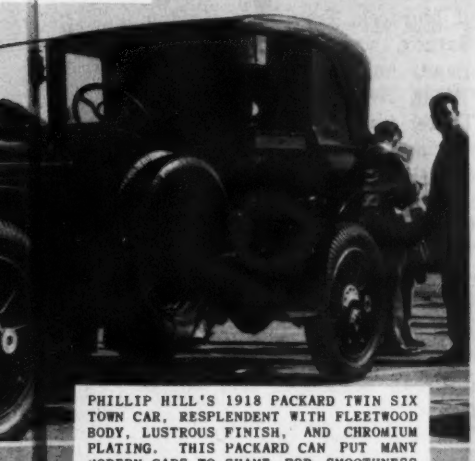
Our Thanks

TO GEORGE F. BRAUER, A NEW CLUB MEMBER, FOR PHOTOGRAPHING OUR CARS AT THIS MEET

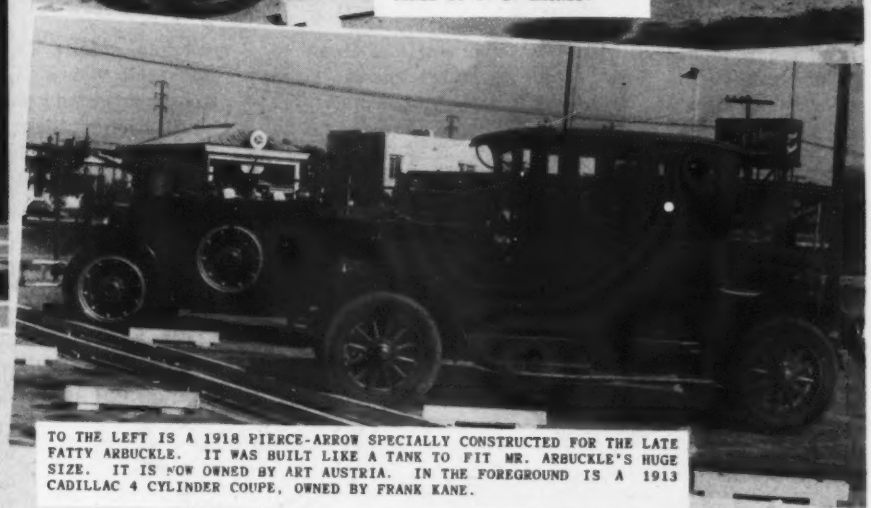


GHT A 1914 FORD
S 18 PACKARD
ELONGING TO THE
RACY 1911 MARMON
RIN AND ALBERT
GY.

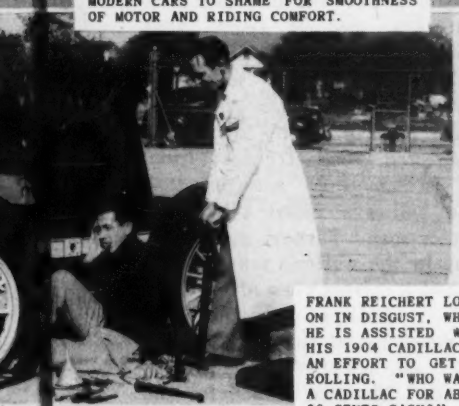
THE OLD FRANKLIN TOURING IN WHICH THESE TWO GENTLEMEN ARE SEATED IS A 1910 MODEL, OWNED BY W. L. HAINES.



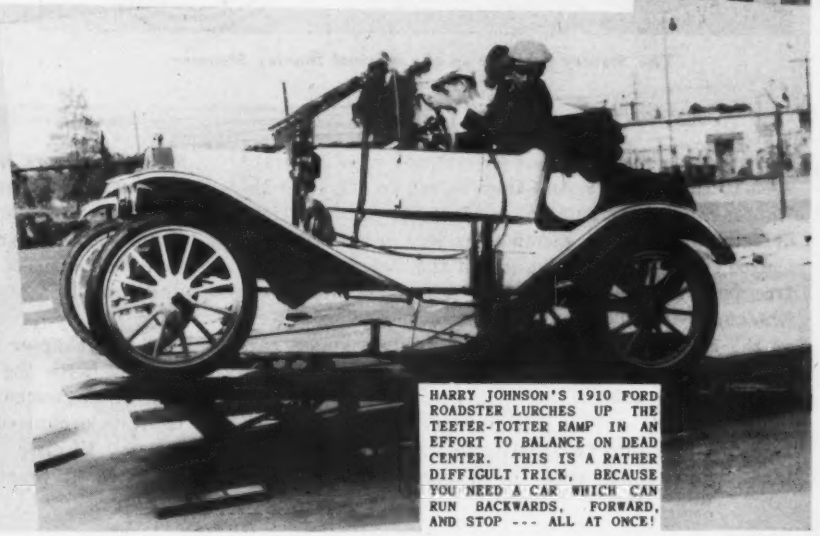
PHILLIP HILL'S 1918 PACKARD TWIN SIX TOWN CAR, RESPLENDENT WITH FLEETWOOD BODY, LUSTROUS FINISH, AND CHROMIUM PLATING. THIS PACKARD CAN PUT MANY MODERN CARS TO SHAME FOR SMOOTHNESS OF MOTOR AND RIDING COMFORT.



TO THE LEFT IS A 1918 PIERCE-ARROW SPECIALLY CONSTRUCTED FOR THE LATE FATTY ARBUCKLE. IT WAS BUILT LIKE A TANK TO FIT MR. ARBUCKLE'S HUGE SIZE. IT IS NOW OWNED BY ART AUSTRIA. IN THE FOREGROUND IS A 1913 CADILLAC 4 CYLINDER COUPE, OWNED BY FRANK KANE.



FRANK REICHERT LOOKS ON IN DISGUST, WHILE HE IS ASSISTED WITH HIS 1904 CADILLAC IN AN EFFORT TO GET IT ROLLING. "WHO WANTS A CADILLAC FOR ABOUT 30 CENTS CASH?" MR. REICHERT WAS HEARD TO EXCLAIM.



HARRY JOHNSON'S 1910 FORD ROADSTER LURCHES UP THE TEETER-TOTTER RAMP IN AN EFFORT TO BALANCE ON DEAD CENTER. THIS IS A RATHER DIFFICULT TRICK, BECAUSE YOU NEED A CAR WHICH CAN RUN BACKWARDS, FORWARD, AND STOP --- ALL AT ONCE!

VE GR OF ANTIQUES ARE, LEFT TO RIGHT, NORDB LOUIS COMBS'S 1913 BUICK, A 1909 SON, BERT BRIGGS'S 1906 STRAIGHT DASH UE'S CADILLAC COUPE.

Rise and Decline of the

By P. M. Heldt

TODAY steam automobiles are relics of a bygone age. They may be found in museums and in the collections of antique-car fanciers, but one never meets them on the public highways. Yet for a period of three years, from 1900 to 1902, when the automobile industry was in its infancy, steam cars were its principal product. In 1899, when a light, cheap steam runabout of attractive appearance was placed on the market, it became popular almost over night. The silence and flexibility of the vehicle—qualities inherent in the steam propulsion system—were apparent even to the onlooker, and they helped to sell it to the "motor-minded" public in spite of its many serious defects, until a light gasoline car was produced which shared some of the advantages of the steamer and was free from most of its defects. A few manufacturers who succeeded in eliminating the more serious defects of the early models continued to produce steam cars for a good many years, but production finally ceased completely in 1923.

The Stanley brothers in the original Stanley Steamer

The history of the steam-propelled road vehicle really divides into two distinct periods. The first of these, which began with the construction of a steam military tractor by Cugnot in France in 1769, extended almost over a century, but did not produce a single really practical vehicle. It may be argued that there is a great difference between a tractor designed to haul field pieces in military campaigns and a private passenger car, and this is quite true, but there can be little doubt that if the early experiments with military tractors and steam-propelled public conveyances had been crowned with success, production of passenger cars for private use would have followed in short order. Developments during the period referred to are connected chiefly with the names of Murdock, Trevithick, Gordon, Gurney, and Hancock in England, and Nathan Read and Oliver Evans in this country. There was a regular steam-carriage boom in England during the 1830s, and one writer lists no fewer than seven different "steam-carriage" and "steam-coach" companies, registered there during that period. From the names of these companies it appears that most of them planned to engage in interurban passenger transportation.

It was about this time that steam power was introduced on railways, and it seems that thereafter men familiar with this motive power were engrossed in problems connected with railway rolling stock, and neglected road transportation. It is sometimes asserted that the railways killed this early motor-road-transport movement, but in the writer's opinion this is not a correct view of the situation. Railroad transportation was much more highly developed at the beginning of the current century, yet it did not prevent the growth of the automobile industry. The real reason for the failure of the early attempts was the lack of a suitable resilient tire that would both cushion road shocks and provide adequate road adhesion for the traction wheels.

A new chapter in motor road transportation opened in 1895 with the advent of the gasoline automobile, and the movement was given a strong impetus by the contests organized here during that and the following years. Electric (storage-battery) vehicles were introduced at practically the same time. Hence there

American Steam Car Industry

Part One

Steam as a motive power for road vehicles was the first to be employed with anything approaching widespread success and there is at least some speculation today regarding the desirability of reconsidering its possibilities for certain special applications. In America, steam cars were the first mass production units turned out by the industry and they gave a marked impetus to its growth. P. M. Heldt, a pioneer automotive engineer who, until his recent retirement, was Engineering Editor of Automotive and Aviation Industries, has written a most interesting series of articles, of which this is the first, on the rise and decline of the steam car in America.—Ed.

were at least three motive powers available, and the question of their relative merits was widely discussed. Men familiar with steam power—of whom there were a great many in the country—usually pinned their faith to steam. They argued that it had been, and was then, the great motive agent of the world's transportation on land and sea, and they felt confident that it would fill a most important role also in road transportation.

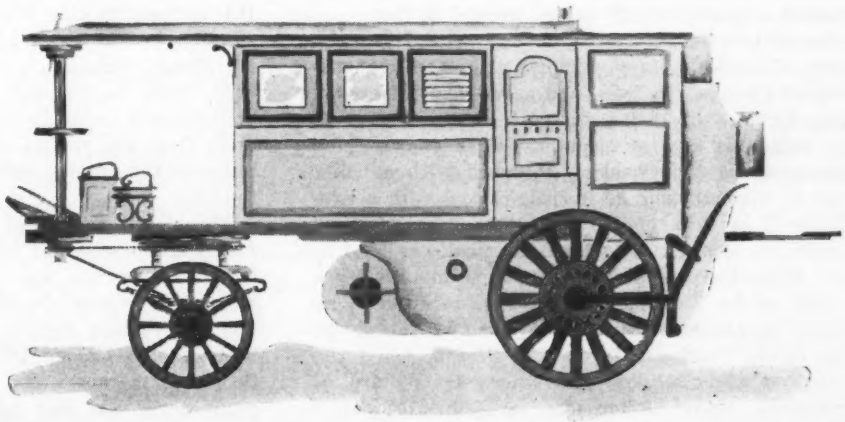
Let us briefly consider the problems that had to be solved to adapt steam power to road locomotion in a practical way. Various types of boiler, including fire-tube and water-tube, were in common use, and flash boilers had been discussed and tried out to some extent. The nearest approach to the conditions met with on an automobile probably were those found on light steam launches. These generally were equipped with vertical fire-tube boilers, coal-fired. Solid fuel, however, was not suitable for use on passenger cars, owing to the dirt, the attention required, and the difficulty of controlling the fire so as to conform to the varying demands for steam. Liquid fuel must be used, and the development of a practical liquid-fuel burner that could be easily started and readily controlled was one of the first problems calling for solution.

Then there was the problem of draft. Draft in furnaces usually is induced by high chimneys. Only a chimney of very moderate height could be used on a car, and even that was objectionable on account of its effect on the appearance.

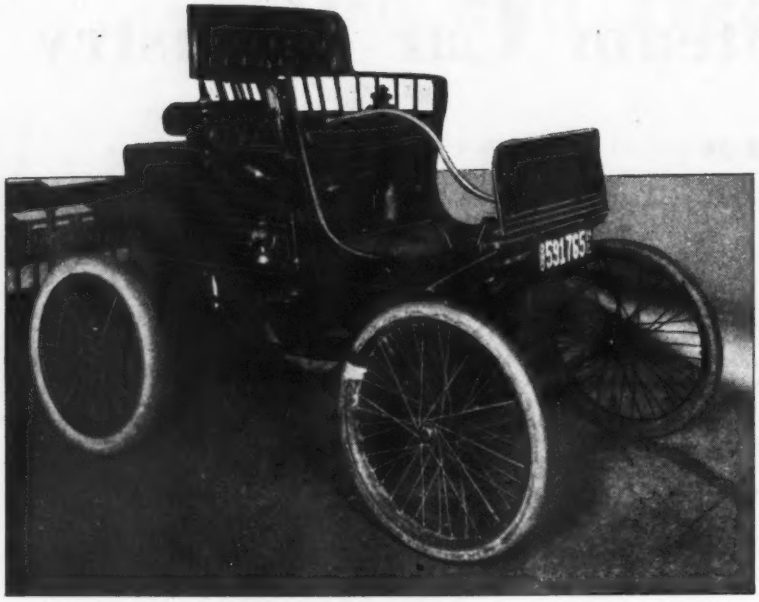
Safety was another consideration. In order that the engine might be able to produce adequate power without being excessively heavy, high steam pressure must be used, and the idea of sitting on top of a boiler carrying, say, 200 lb steam pressure, subjected to the additional strains due to road shocks, with the ever present danger of collision and upset, did not appeal to the timid, hence it was necessary that convincing proof of the safety of the boiler be furnished to prospective buyers.

Control of water and fuel feed had to be more or less automatic, in view of the exceedingly variable demand for power in driving up hill and down dale. All high-pressure steam plants so far had required licensed engineers to operate them, and when the subject of steam vehicles was broached, the first question usually asked was—"Does it require an engineer to run it?" This could not be admitted, as it would have constituted a fatal handicap for steam in competition with the other motive powers.

Other problems related to the location on the car of the various parts of the powerplant, the transmission



Hancock Steam Coach "Autopsy" (1833). This and other steam propelled vehicles were operated on the roads of Great Britain in regular service for a period of years. Nearly 4,000 passengers, for example, were carried by this coach and a sister vehicle between London and Moorgate and Paddington during the summer of 1834. The London and Birmingham Steam Coach Co. was organized at about that time.



Mobile steam car at early Chicago show

of power from the engine to the driving wheels, and the disposal of the exhaust products—both smoke and steam—in such a manner that they would not annoy the occupants, nor be too conspicuous to people in the street.

The earlier experimental work on steamers had been done for the most part on large vehicles of the omnibus type, and requirements with respect to the powerplants were not so exacting. In the new era in road transport ushered in by the bicycle, attention became centered on the small vehicle for family use. Several pioneers in the steam vehicle field whose work immediately preceded the manufacturing period realized the requirements with respect to motive power in small vehicles, and the results achieved by them had a certain influence on later developments. It is noteworthy that most of the development work in connection with light steamers was carried out in New England, and particularly in and around Boston.

Conspicuous among these pioneers was Sylvester H. Roper of Roxbury, Mass., who had a four-wheeled machine on the road in 1863, and a two-wheeled one (a steam bicycle) in 1870. All of his later work was done with this type of machine. With one of these steam-powered two-wheelers, equipped with a boiler of 10 in. diameter and 20 in. height, and with a two-cylinder 2 by 4-in. engine, Roper made a mile in 2 minutes 14 seconds. Powdered charcoal was used as fuel. Roper continued his experiments until his death in 1899, which resulted from injuries received in an accident sustained when demonstrating his latest machine on the Charles River track at Boston.

Another early worker was James H. Bullard of Springfield, Mass. After some experiments with a coal-fired boiler, Bullard developed a multiple-jet liquid-fuel burner in which the fuel was atomized by air under pressure. His most outstanding work was done in connection with automatic devices, and a machine he brought out in 1886 is believed to have been the first in which all of the essential functions were automatically controlled. The air pressure for fuel feed and atomization, the fire itself, the water supply to the boiler, and the boiler pressure were all designed to be automatically maintained between fixed limits, leaving the driver free to give his undivided attention to the road and to other traffic that might be encountered. This machine was operated in the streets of Springfield in 1886. From 1900 on a steam car of Mr. Bullard's design, known as the Victor, was manufactured by the Victor Automobile Company, which was organized by A. H. Overman, a former bicycle manufacturer.

Credit for much of the pioneer work in the light steam-car field is generally accorded to George E. Whitney of East Boston, Mass. Whitney built his first machine in 1896 and drove it over the roads to New London, Conn., whence he shipped it to New York by boat. He built a second machine in 1897. This was exhibited at the bicycle show held in Mechanics Hall, Boston, that winter, where it was driven around the building and served to give many people their first automobile ride. The early Whitney vehicles were equipped with a fire tube boiler weighing 83 lb and with a 4-6 hp engine of the enclosed type, secured to the forward side of the boiler.

Whitney was a prolific inventor, and in July, 1900, had five patents on steam-wagon construction issued to him, with no less than 159 claims. All of these patents were assigned to the Whitney Motor Wagon Company of Boston. The improvements covered by these patents related chiefly to the drive, running gear and control. It is noteworthy that Whitney used the tubular trussed running gear (which later on became very popular for steam vehicles), a cross spring in front, radius rods from the swiveled front axle to the frame, a boiler-engine assembly under the single seat, and chain drive from the engine to the rear axle, with a band brake on the exposed differential gear at the center of the axle.

The general opinion at the time seemed to be that as far as the powerplant was concerned, there was little chance of securing any really broad patents, because steam power was already more than a century old, and the various devices used in its application had been developed along different lines to a high degree. So far as is known, the Whitney Motor Wagon Company never did any manufacturing, and it finally passed under the control of the Locomobile Company

of America through stock purchase.

To the Stanley brothers of Newton, Mass.—Francis E. and Freeland O.—belongs the credit for having carried the improvement of the light steam carriage to a point where it attracted large capital and became the basis of an industry which for a period of a few years developed at a phenomenal rate. They represented the rather rare combination of mechanical ingenuity and business acumen. The Stanleys, who were manufacturers of photographic dry plates, built their first machine in 1897. They had been interested in mechanical road vehicles since 1887, when they lived in Lewiston, Maine, where a machinist by the name of E. F. Fields built a steam car.

The first Stanley car was equipped with a fire-tube boiler 14 in. in diameter and containing ½-in. tubes 13 in. long. A novel feature of the boiler was that it had a shell of copper instead of steel, this shell being wound with piano wire for strength, the idea having been borrowed from Hiram Maxim, inventor of the wire-wound gun.

While the first Stanley steamer had no reverse motion, which was considered unnecessary for country use in view of its light weight (about 400 lb), this deficiency was remedied in the second machine, the engine of which was equipped with a Stephenson link motion. On the first vehicle there was an automatic boiler feed, intended to relieve the driver of the duty of watching the water glass, but this proved to be unreliable, and a water gauge glass was later fitted at the side of the body. The engine was a two-cylinder, vertical, double-acting type, with variable cut-off.

Stanley Brothers sold their first steam car in August, 1898, and the success of this first machine induced them to make plans for the production of the vehicle on what at the time was regarded as a large scale. By the end of the year they had a lot of 100 in production, and more than this number had been sold. All of the major parts were being made in outside shops, the work at the Newton plant being confined mainly to assembling. However, the various parts were all designed by or under the direction of the Stanleys, who also supervised the manufacturing operations.

In the spring of 1899 John Brisben Walker, at that time publisher of the *Cosmopolitan Magazine*, purchased from the Stanley brothers the rights to their steam car, as well as the plant in Newton, Mass., and secured the services of the brothers for a period of one year. The deal, which was said to have involved a cash payment of $250,000 to the Stanleys, occasioned much discussion at the time, more particularly because it seemed very doubtful whether the conveyance of the rights would give Mr. Walker any protection against competition in the steam-carriage field. However, the Stanley car seemed to be ahead of all competition from the standpoint of all-around practicability, and Walker's plan seems to have been to secure a safe lead by launching immediately an aggressive manufacturing and sales campaign.

Shortly after having acquired the Stanley rights, Mr. Walker disposed of a half interest in them to Amzi Lorenzo Barbour, the asphalt magnate. For a time Messrs Walker and Barbour managed the business jointly, but later two companies were organized to manufacture the little steamer, the Locomobile Company of America, under the control of Mr. Barbour, and the Mobile Company of America, of which Mr. Walker was the head. Both engaged in the manufacture of steam runabouts of substantially identical design, known, respectively, as the Locomobile and the Mobile. In the division of the interests the Stanley plant at Newton, Mass., went to the Locomobile Company, which in 1899 erected on the site a three-story factory building about 40 by 100 ft in dimensions. The demand for the Locomobile grew by leaps and bounds, and in order to cope with it, manufacturing facilities had to be extended rapidly.

Part Two

AT THE turn of the century the relative advantages of the three most available motive powers—electricity, steam and gasoline—were a much discussed topic. Steam excelled by reason of its flexibility and silence, and what impressed people most was the power of the steam car on hills. A most effective demonstration of the steamer's climbing power was given when F. O. Stanley, accompanied by Mrs. Stanley, on August 31, 1899, ascended Mount Washington, the highest mountain in New England, in one of the little steam cars, a feat which was reported all over the country. The summit is about 6300 ft above sea level, and the ascent involved a climb of 6000 ft. This rise extends over a distance of 10 miles, so that the average grade is about 12 per cent. It took 2 hr 10 min. to make the ascent, including the time spent in replenishing the water supply en route.

In 1900 the Locomobile Company acquired a large tract of land at Seaside Park, Bridgeport, Conn., on which it erected a four-story brick factory building. The plant was occupied in May, 1901, and became the headquarters of the company. John Brisben Walker's concern, the Mobile Company of America, acquired a factory site at Kingsland Point, Tarrytown, N. Y., where a three-story brick factory was erected (which later became the nucleus of the General Motors Eastern assembling plant). When the plant at Bridgeport was completed, Locomobile manufacturing operations were concentrated there, and the plant at Newton, Mass., reverted to the Stanley brothers, who then engaged anew in the manufacture of light steam cars for their own account. Under the management of S. T. Davis, Jr., son-in-law of Mr. Barbour, the Locomobile Company soon rose to a position of leadership in the industry. It inaugurated a forceful publicity campaign, and the car quickly became known, not only throughout the United States, but in foreign countries as well.

A longitudinal vertical section and a plan view of the powerplant of the Locomobile are shown in Figs. 2 and 3 respectively. The vertical fire-tube boiler *A* is located under the seat, and the gasoline burner *B* is attached to it at the bottom. Water is carried in tank *C*, which partly surrounds the boiler and fills the rear of the body space. Gases of combustion pass from the fire box between burner and boiler through the copper tubes of the boiler into flue *D*, which extends toward the rear and has two outlets, *E* and *F*. When steam is being raised with the vehicle at rest, the flue gases are discharged upward back of the seat, but when the vehicle is in motion they are discharged downward at *F*, so they will not annoy the occupants. To this end the exhaust pipe from the engine is carried into the vertical discharge flue, where it terminates at *G*. Discharge of the exhaust produces an ejector effect, which carries the flue gases along with

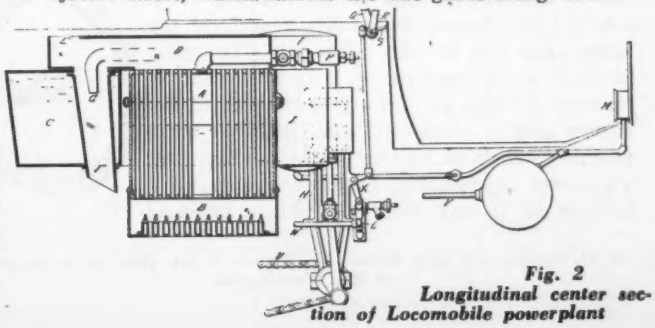


Fig. 2
Longitudinal center section of Locomobile powerplant

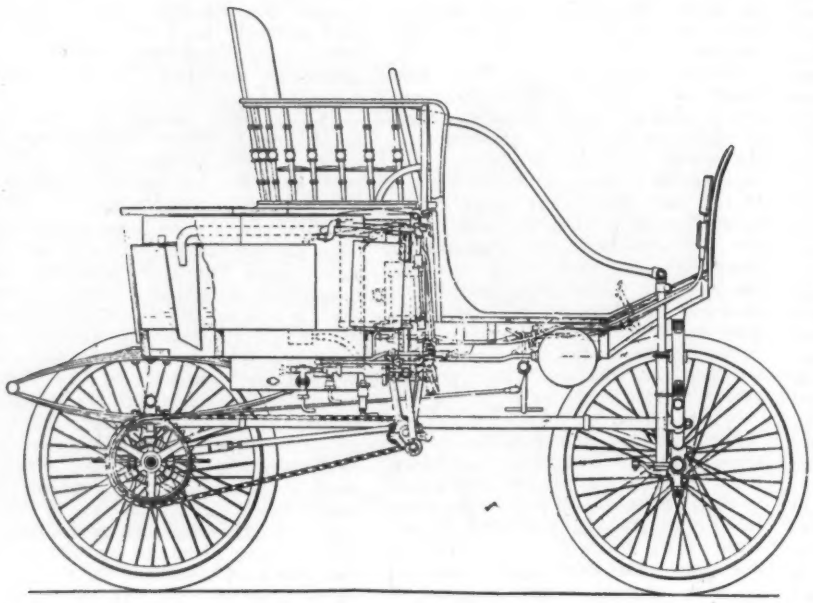


Fig. 1—Cutaway side view of the Locomobile steamer

the steam. Locating the water tank so that it partly surrounds the boiler, and discharging the exhaust steam and flue gases through it, causes some of the waste heat to be transferred to the water, preheating it and reducing the fuel consumption.

The burner *B* is essentially a multiple-unit Bunsen burner. It is a flat cylinder of the same diameter as the boiler, the headers of which are connected by numerous air tubes. Gasoline from the tank is first passed through a pipe through the boiler. It there absorbs sufficient heat so that when it issues from the nozzle at the end of the fuel tube it flashes into vapor. The discharge end of the fuel pipe is located within a larger pipe entering the burner from the side, through which air is drawn by the injector effect. This air mixes with the fuel vapor and forms an over-rich mixture which issues through numerous fine drill holes surrounding the air tubes in the upper header. There this over-rich mixture combines with additional air rising through the air tubes, to form a substantially perfect combustible mixture which burns in the fire box and in the boiler tubes. When starting from cold the fuel cannot derive any heat from the boiler, and use is then made of a so called "torch," which consists of a U tube that is inserted through an opening in the side of the burner and so connected that the fuel must pass through it on its way to the mixing tube. This torch is previously heated to redness in a furnace or in any other convenient manner.

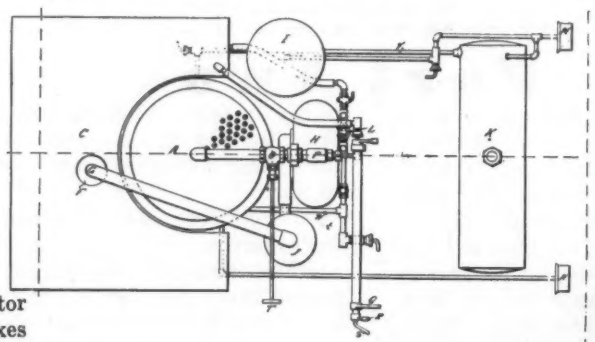


Fig. 3—(Above) Plan view of Locomobile powerplant

F. O. Stanley and Mrs. Stanley are shown in this view taken on top of Mt. Washington

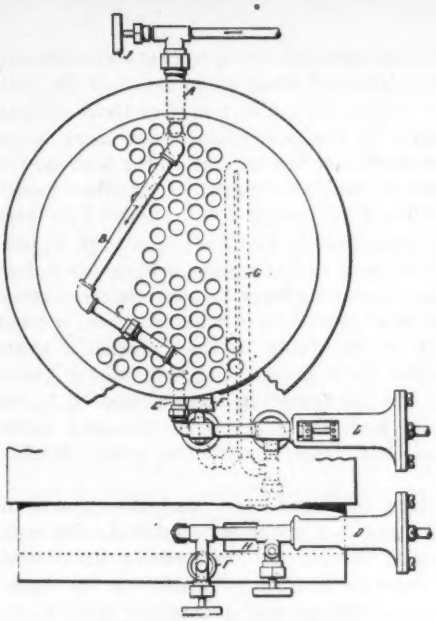


Fig. 4—Fuel vaporizing and control system in plan and section

A, fuel pipe entering boiler casing; B and C, connections for vaporizing pipe; D, automatic pressure regulator; E, pipe connection to pressure regulator; F, mixing tube; H, opening in fire box for introduction of starting torch; J, shut-off valve in fuel line.

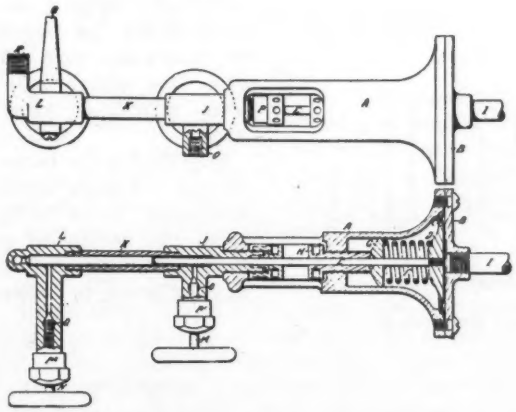


Fig. 6—Plan and section of automatic pressure regulator

A, body casting; B, head plate; C, sheet-steel diaphragm; D, metal block resting against diaphragm; E, valve stem; F, coil spring; G, spring plate; H, adjusting screw; I, pipe to water space of boiler; J and L, T-fittings; K, nipple; M and N, needle valves; O, tapped boss; P, P', P", caps of stuffing boxes; Q, nozzle and passage to nozzle.

Fig. 7—(Right) Front and side elevations of steam engine

A, A, cylinders; B, valve-chest cover; C, piston; D, slide valve; E, piston rod; F, stuffing box; G, frame member; H and I, frame studs; J, J, bearing bosses of frame; K, K, crank arms; L, L, connecting rods; M, crosshead; N, N, crosshead guides; O, O, P, P, eccentric rods; R, reversing link; S, valve rod; T, stuffing box; U, sprocket pinion; V, steam pipe; W, exhaust pipe.

Sometimes the fire would become extinguished while the car was parked away from home, and finding a means of heating the torch to redness was then quite a problem.

The two-cylinder vertical engine *H* is located directly in front of the boiler and drives by chain *V* to the differential at the center of the rear axle. The cranks of the engine are set at 180 deg. and the engine therefore has dead centers. Occasionally it would stop in dead center, and opening the throttle then would not start the car either backward or forward, even though there might be full pressure in the boiler. This sometimes proved very puzzling to novices, who had to send for an "expert" to get them out of their predicament. To the experienced driver it was a matter of little moment, because all that was necessary was to push the car a few inches in one direction or the other to get the engine off dead center.

Steam from the boiler passes through an auxiliary valve *O* and the throttle valve *P* to the engine. The early Locomobiles did not have the auxiliary or shut-off valve. Exhaust steam from the engine passes through the muffler *J* to the discharge flue *F*. In some of the later designs the muffler was developed as a feed-water heater by placing a pipe coil in it through which the feed water was passed on its way from the tank to the boiler.

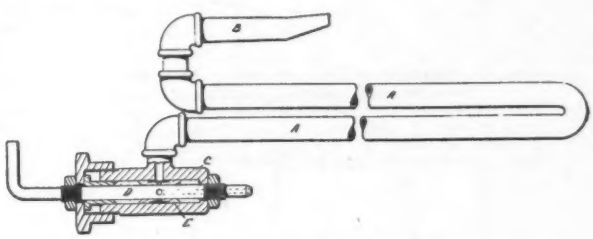
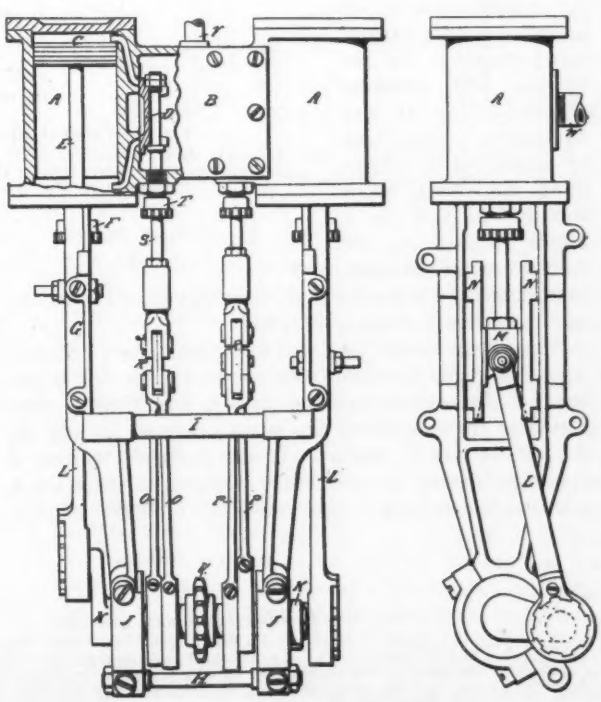


Fig. 5—(Above) Starting torch

A, A, U-tube; B, Nozzle; C, T-fitting; D, threaded rod for attaching torch to pressure regulator; E, sleeve between rod and T-fitting.



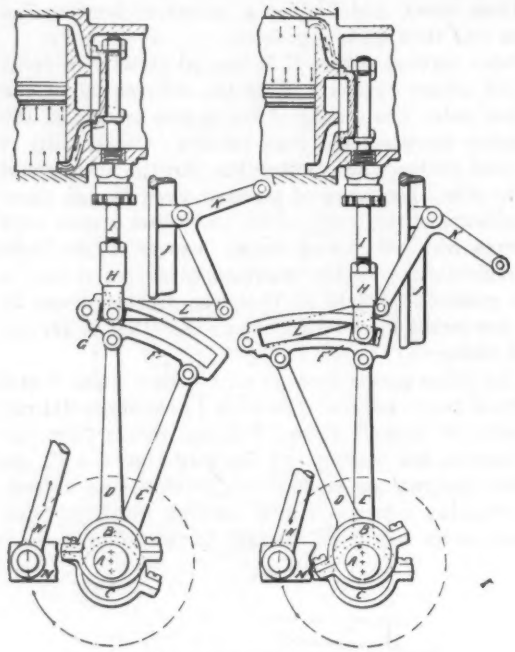


Fig. 8—Stephenson-link reversing gear in forward and reverse positions

A, crankshaft; B, C, eccentrics; D, E, eccentric rods; F, link; G, link block; H, fork; I, valve rod; J, frame member; K, reversing bell crank; L, link; M, crank; W, connecting rod.

conditions, and was provided with a bypass valve through which the water delivered could be returned to the tank when the water level in the boiler was at or above normal.

For the control of the powerplant there were three short levers or handles on the outside of the body at the right of the driver, secured to concentric shafts. Referring to Figs. 2 and 3, the center shaft, operated by lever *S*, controls the bypass valve. The lever next to it, *R*, controls the reversing gear of the engine, a Stephenson link motion, while the remaining lever, *Q*, controls the throttle valve. The car was steered by a tiller and had a band brake operating on the drum of the differential gear, which was applied by a pedal. One end of the brake band was fixed, and the operating pull was applied to the other end, which made the brake quite powerful under forward motion, but rather ineffective under reverse motion.

Pipe connections from the upper and lower parts of the boiler were made to a water gauge outside the body on the driver's side. The driver observed the water level in the gauge through a mirror located on the dash. Breakage of gauge glasses was a frequent occurrence, and to prevent blowing off of the boiler on such occasions, conical check valves were placed in the pipe connections. Unfortunately, these check valves had a habit of rusting to their seats. When this occurred, the water level in the gauge would remain absolutely constant, while ordinarily it varied continuously, and the experienced driver would know at once what was wrong. With a novice at the wheel it was not uncommon for the boiler to run dry and burn out while the gauge indicated a normal water level.

Fuel feed to the burner was regulated automatically by a valve under the control of a diaphragm. The latter was subjected to boiler

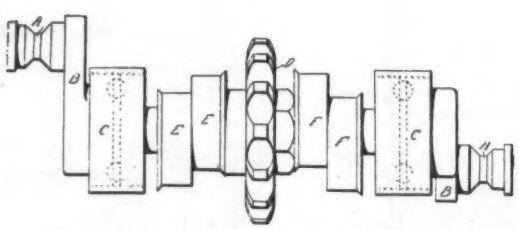


Fig. 9—Crankshaft assembly of engine

A, A, crankpins; B, B, crank arms; C, C, ball bearings of crankshaft; D, sprocket pinion; E, E, F, F, eccentrics.

Gasoline was carried in the tank *K* under the floor boards. Fuel was fed to the burner by air pressure, an air tank *T* being provided for the purpose. Air pressure of about 35 psi was pumped up in this tank by means of a bicycle pump, the hose of which was connected to a nipple located on the dash close to the pressure gauge *M* for the air tank. Another gauge *N* on the dash indicated the boiler pressure.

Water from the tank was fed to the boiler by a plunger-type feed pump *L*, which was operated from the crosshead of the engine. As the plunger was directly connected to the crosshead, the pump operated as long as the vehicle was in motion. It was designed to have a somewhat greater capacity than required to maintain a constant water level in the boiler under normal driving

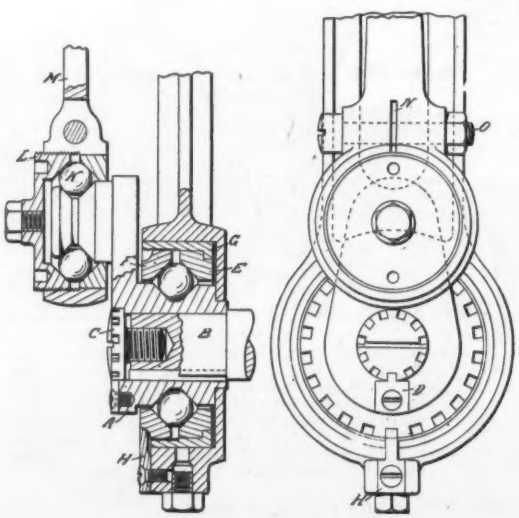


Fig. 10—Ball-bearing crank assembly

A, crank; B, shaft; C, retaining screw; D, screw locking plate; E and F, cups of crankshaft ball bearing; G, mounting ring of ball bearing; H, locking plate; K, crankpin ball bearing; L, adjustable cup of crankpin ball bearing; M, connecting rod; N, saw slot in connecting rod; O, connecting rod clamp screw.

pressure on one side and to the pressure of a spring on the opposite side. Normally the spring pressure predominated, and the valve was open, allowing fuel to flow to the burner. When the boiler pressure reached the value for which the regulator was set, the steam pressure on the diaphragm overcame the spring pressure and the fuel valve closed. With the fire reduced to a minimum, the boiler pressure would soon drop, the spring would overcome the steam pressure on the diaphragm, and the fire would be turned on full blast again.

Owing to the instant commercial success of the Locomobile, many other light steam carriages of the same general design appeared on the market in quick succession. Some of them were what might be described as Chinese copies of the original, while in others creditable attempts had been made to eliminate some of the known weaknesses of the prototype. At the first automobile show held in America, in Madison Square Garden, New York, in November, 1900, steam cars were exhibited by no less than nine concerns. A feature of this exhibition was a ramp with gradually increasing grade, built on the roof of the Garden, on which exhibitors could demonstrate the hill-climbing abilities of their cars. Needless to say, the steam-car contingent took full advantage of this opportunity. In 1901 the number of steamer-exhibitors at the New York show rose to 14, but this marked the climax, for at the next show, held early in 1903, there were only six exhibitors left in the steam class.

Among the advantages of the light steam car were its silence of operation, the great flexibility of its powerplant, which enabled it to proceed at a mere crawl in traffic and to ascend hills at considerable speed, and its light weight and low cost. The first Stanley car weighed only about 400 lb, but each succeeding model was somewhat heavier. The car had a wheelbase of about 56 in. and a tread of 50 in., and was equipped with 28-in. bicycle wheels. The original price of the Locomobile was $600, but later the car sold at $750. As may be readily imagined, the car had many imperfections, most of them the result of the extremely light construction. What some of these faults were was to be read between the lines of the announcement of a new model, issued during the summer of 1900, when one-thousand of the earlier cars were said to be in use.

There was, first, an increase of 50 per cent in the water capacity, and a somewhat smaller increase in the fuel capacity. The necessity of replenishing the water supply every 20 miles or so had been found quite a handicap. Both the air tank and the fuel tank were made of heavier stock, as it had been found difficult to keep the original tanks air-tight. The original body was rather cramped, and in the new model both the seat and the wheel gauge were widened. A side steering lever was substituted for the tiller. An auxiliary throttle was provided, which enabled the driver, when leaving the vehicle, to shut off the steam from the engine by means of a valve in a comparatively inaccessible position, so the car could not be started accidentally by meddlers. The safety valve was so arranged that it would blow off into the water tank. This did away with the noise of the sudden blow-off, which would generally occur when the car was left at the road side, and was the cause of frequent horse runaways. An auxiliary hand feed pump was provided, as it had been found that the regular pump often failed to keep the water in the boiler at the proper level.

Part Three

Less meteoric than the rise of the Locomobile was that of the Whitney-Stanley or McKay steamer, which was manufactured at Lawrence, Mass. Its price of $1800 seemed very high at the time, especially when compared with the $600 asked for the Locomobile; but from the mechanical standpoint it was a very creditable production.

Another concern which figured quite prominently in the early history of the steam car—and of automobiles generally—was an offshoot of the American Bicycle Co., popularly known as the Bicycle Trust. In 1901 the automobile business of the "Trust" was separately incorporated as the International Motor Car Co., with A. E. Schaaf, previously New England Manager for the Gormully & Jeffery Co., of Chicago, as president. At that time the rights to a steam car designed by F. C. Billings of Hartford, Conn., were acquired, and the first machine built was exhibited at the Madison Square Garden Show in New York in November, 1900. The car was named the Toledo and was placed in production in the former Lozier bicycle plant in Toledo, Ohio.

While most of the light steam cars carried fire-tube boilers, the Toledo was equipped with a water-tube boiler. A diagrammatic sectional view of this boiler is shown herewith (Fig. 11). It consisted of two seamless steel shells, bolted together at top and bottom to form the water and steam spaces between them. Within the inner shell there were eight conical coils (only one of which is shown), the ends of which were secured into the inner shell near the top and bottom respectively.

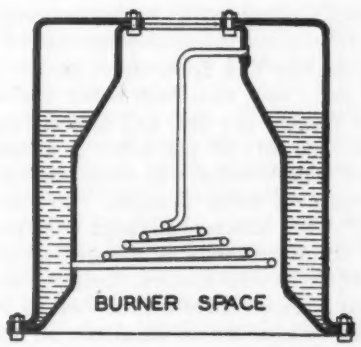
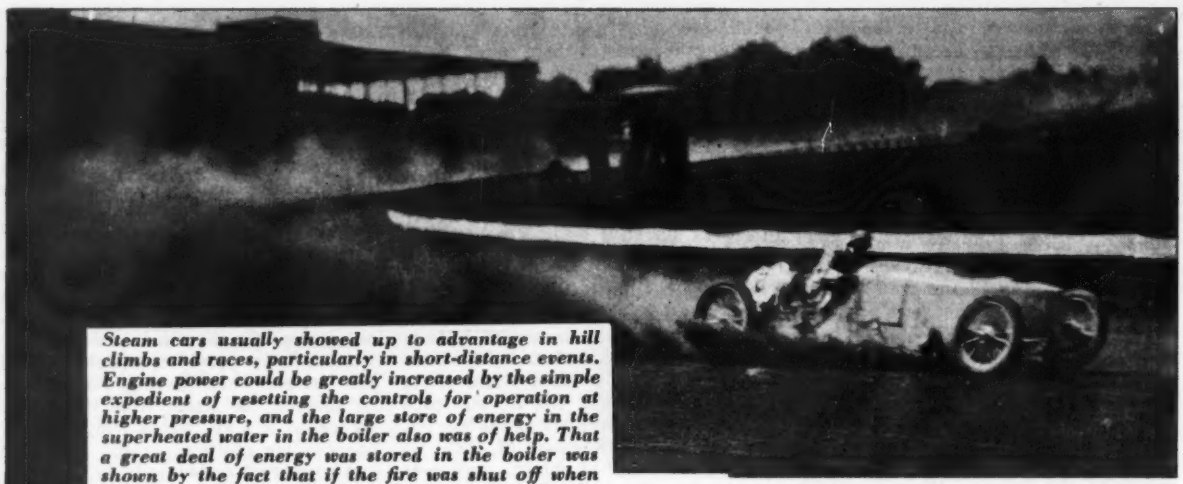


Fig. 11 — Sketch of Toledo boiler, showing one of the eight coils.

Water-tube boilers were largely used in stationary and marine powerplants at the time, because the construction facilitated circulation of the water and transfer of heat, and the heating surface required per horse power output was less than with fire-tube boilers. However, for given overall dimensions and a given weight there is usually less heating surface in a water-tube than in a fire-tube boiler.

A characteristic of the Toledo steamer was that it, the same as another popular steam car to be referred to later, was built without the conventional dashboard. The machine was of much heavier design than the Stanley, weighing 1450 lb with all supplies on board. One of its shortcomings was insufficient steaming capacity for heavy roads. The engine was completely enclosed and had balanced piston valves instead of slide valves, which reduced the losses due to valve friction. An auxiliary hand feed pump was combined with the steering tiller, so that the driver could assist



Steam cars usually showed up to advantage in hill climbs and races, particularly in short-distance events. Engine power could be greatly increased by the simple expedient of resetting the controls for operation at higher pressure, and the large store of energy in the superheated water in the boiler also was of help. That a great deal of energy was stored in the boiler was shown by the fact that if the fire was shut off when the boiler pressure was normal, on good roads, the car would run for about two miles before it came to a stop. A world's speed record of a mile in 29 3/5 sec was established by F. H. Marriott at Daytona Beach, Florida, in January, 1907, in a special Stanley racer dubbed the Tea Kettle.

Scene of early motoring days—A steam racer on a dirt track.

the crosshead pump when necessary by moving the steering tiller up and down like a pump handle. A sectional view of this pump is shown in Fig. 12.

A flash boiler has been defined as one in which there is no water level. These boilers usually consist of coils or lengths of pipe which are so connected together that they form a continuous passage into which water is fed at one end and from which steam is drawn at the other end. In a true flash boiler the water enters at the end nearest the fire, and flashes into steam instantly, as this part of the boiler is usually near red heat. Such a flash boiler was developed for automobile use in France by Leon Serpollet. In this country a number of flash boilers had been installed in steam yachts by the Herreshoffs in pre-auto days, and Elihu Thomson of the General Electric Company had done some development work on them with a view to their adaptation to road vehicles, but no American car equipped with a true flash boiler went into production.

In 1900 the White Sewing Machine Co. of Cleveland, Ohio, placed on the market a medium-weight steamer equipped with what was described as a semiflash boiler. A plan and side view of the coil assembly of this boiler are shown in Fig. 13. It consisted of 13 superposed horizontal spiral coils of ½-in. copper tubing, except for the lower, superheating coils, which were of steel. Between coils there were narrow separating pieces, which supported them and also held them in place laterally. The coils were enclosed in a thin sheet-steel housing lagged with asbestos.

Both ends of each coil were carried to the top of the boiler, where the outer or outlet end of one coil connected to the inner or inlet end of the one next below it by a horizontal pipe. A crosshead pump forced water into the inner end of the topmost coil, and steam was drawn from the outer end of the bottom coil. The water turned into steam in one of the bottom coils, the exact point changing with operating conditions, but it usually was sufficiently high so that the steam was superheated to about 800F in the coils below it.

In a boiler of this type the pressure depends on the amount of water in it. When this decreases the pressure rises, and vice versa. It was therefore necessary to control the feed automatically, and a feed regulator was fitted which was so designed that an increase in the boiler pressure above normal

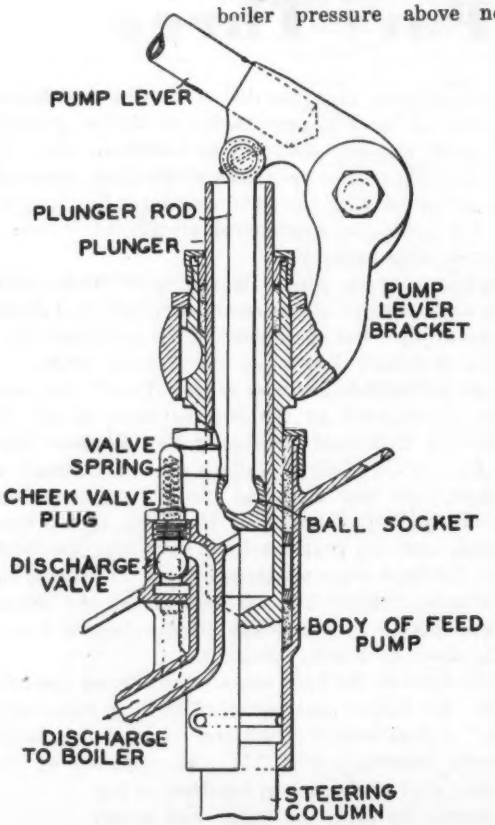


Fig. 12—Hand feed pump combined with steering tiller.

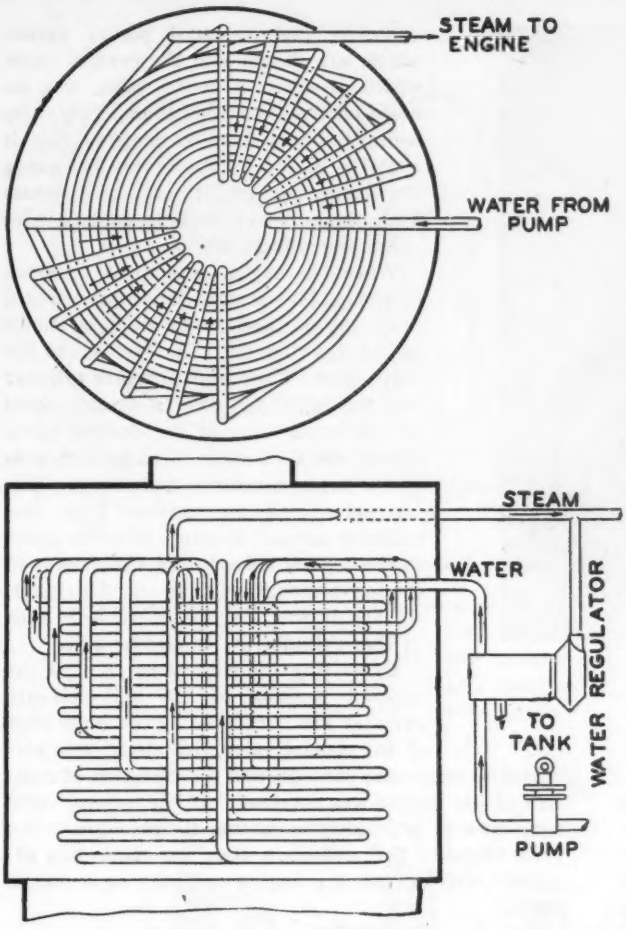


Fig. 13—Plan and elevation of White semi-flash boiler.

closed the bypass valve and let all of the water delivered by the pump enter the boiler. If this resulted in an excess of water in the boiler, the pressure dropped and the bypass opened again. The regulator was adjusted to maintain the pressure at about 200 psi, but the safety valve was set to open only at 500 psi, the tubes having sufficient strength to safely withstand this pressure.

Fuel feed was automatically controlled by a thermostatic device, and a sectional view of this regulator is shown in Fig. 14. It included a tubular casing which formed the connection between the lowest and next-to-the-lowest boiler coils. Within the casing and secured to the head thereof was a copper tube which was closed at its outer end and contained a steel rod that acted on the fuel valve through a bell crank. When the steam temperature rose above normal, the greater expansion of the copper tube as compared with the steel rod caused the protruding end of the latter to withdraw and allow the fuel valve to close. Reduction of the steam temperature had the opposite effect and opened the valve.

The engine of the White steamer was a two-cylinder vertical one, with slide valves and Stephenson-link reversing gear. The reversing lever extended forward through a slot in the kneeboard of the car and moved on a notched sector, so that it was positively held in place. The need for such an arrangement was emphasized by rather unpleasant experiences of owners of other light steam cars. With these machines it would sometimes happen that when the driver opened the throttle to drive off, the car would start backward instead of forward. The reason for this, of course, was that the position of the reversing gear had been reversed by the inertia of a sudden stop. A photo of one of the early White steamers is shown in Fig. 15.

A lot of one-hundred of these steamers passed through the shops during the spring of 1901. One of the cars took part in the New York-Buffalo endurance contest of that year, and later was exhibited at the Pan-American Exposition in Buffalo. These steamers came prominently to the front the following year, when five of them took part in the New York-Boston-and-back endurance contest, in which all of them made perfect scores. The competing vehicles were equipped with condensers located at the front, which enabled them to complete the half-day stages of about 50 miles without stopping to renew their water supply. The White steamer was the design of Rollin H. White, a graduate in mechanical engineering of Cornell University.

A number of other improvements made in steam cars and their equipment may be briefly mentioned here. One of the inconveniences of the light steamer was that the water supply of about 20 gallons had to be renewed every 20 or 25 miles. If service stations had been as numerous as they are today on the

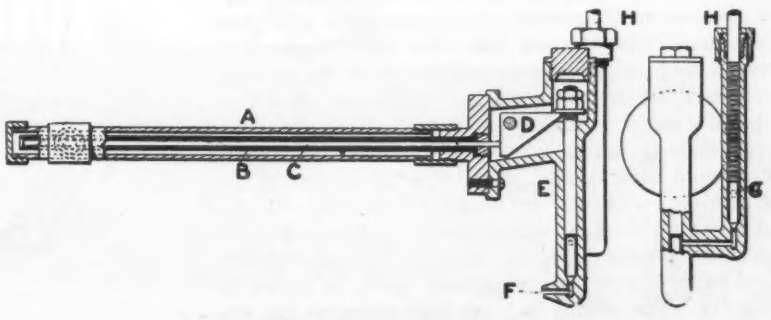


Fig. 14—White thermostatic fuel regulator.

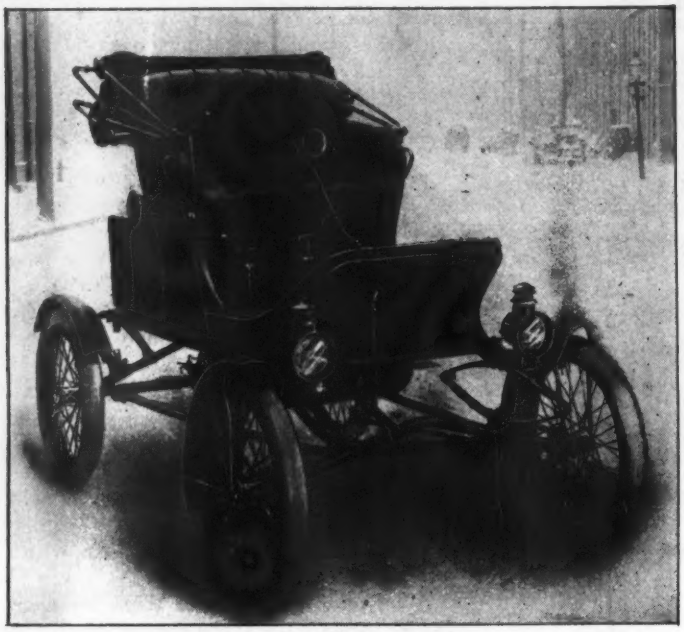


Fig. 15—The first White steam car.

heavily-traveled main roads, this would not have mattered very much, but the day of roadside service for automobiles had not yet dawned. Originally a rubber pail was carried on the car, but it can be readily imagined that searching for a source of water every hour or so, and then transferring 20 gallons or more to the tank of the car with a rubber pail detracted greatly from the pleasures of motoring. The task of replenishing the water supply was facilitated by the installation on the car of a siphon or steam ejector and a length of rubber hose. With this equipment, all that was necessary was to place the end of the hose in a pond or brook—provided one was handy—and open the steam valve. The equipment referred to is illustrated in Fig. 16.

The steam consumption of early automobile powerplants was very high, and various means were resorted to with a view to making the engines more efficient, including compounding. With a two-cylinder compound engine, if the high-pressure cylinder was of the same size as each of the cylinders of a two-cylinder simple engine, the maximum torque which the engine could produce was necessarily a good deal less, and a type of valve gear was therefore provided which made it possible to admit live steam to both cylinders whenever conditions called for it, as in climbing steep grades.

A very ingenious control valve, used in Stearns compound engines, made it possible to operate the engine either simple or compound, as desired, and also acted as a reversing means, obviating the need for a special reversing gear. A sectional view of this control valve, together with adjacent parts, is shown in Fig. 17. The engine had one high-pressure and one low-pressure cylinder, parts of which are shown in the drawing at the left and right, respectively. Both cylinders had balanced piston valves, which are shown, and the control valve, which also was a piston valve, was located centrally between them. This valve ordinarily was fixed in position, but it could be moved by the driver to change the operating conditions. Live steam from the boiler entered the control-valve chest centrally at the top.

When the engine was to be operated compound, the control valve was lowered from the position in which it is shown in the drawing until the passage to the valve-chest of the high-pressure cylinder (on the left) was completely uncovered by the upper edge of the control valve. Steam was then distributed to both ends of the high-pressure cylinder by its piston valve, and the exhaust from this cylinder passed through internal ports in the control valve to the valve chest of the low-pressure cylinder (on the right), whence it was distributed to both ends of that cylinder by its piston valve.

By raising the control valve until the exhaust passage of the high-pressure cylinder was uncovered by the lower edge of the control valve, live steam was permitted to enter that passage, and the direction of rotation of the engine was reversed. If the control valve were lowered sufficiently to uncover the passages to the valve chests of both cylinders, then live steam was admitted to both, and the engine operated as a simple engine.

All or nearly all steam cars other than those developed by the Stanley brothers carried pilot lights for starting the fire and for relighting the main burner after it had been turned off while the car was parked. The pilot light extended through the burner and had a part of the vaporizer located directly above it. One such pilot light is illustrated in Fig. 18.

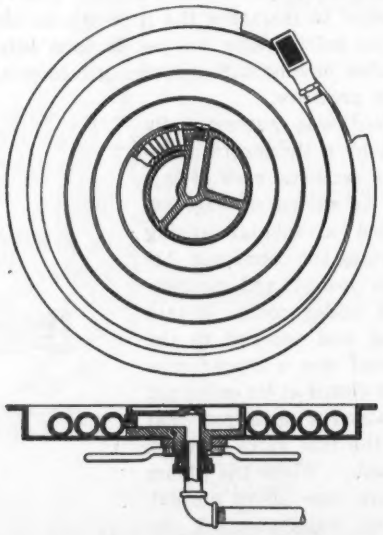


Fig. 16—Siphon for filling water tank.

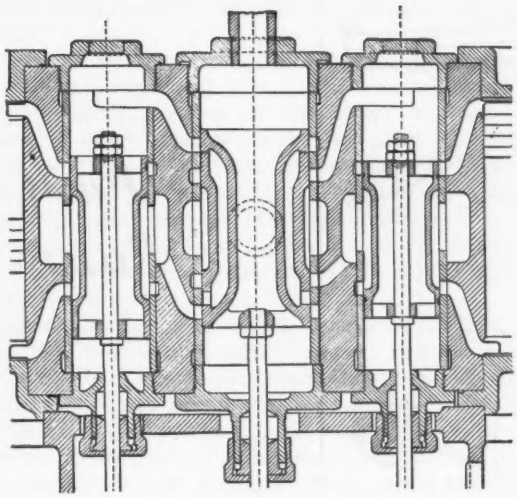


Fig. 17—Stearns control valve for compound engine.

To judge by the number of patents issued on boiler feed systems, the original system with hand control was most unsatisfactory. The driver had to constantly watch the water gage through the dash mirror, when his eyes should be on the road. Owing to the fact that the check valves sometimes would stick, the gage was far from reliable, and breakage of gage glasses was a major cause of trouble. To this must be added the fact that on heavy roads, where much steam was required, the crosshead pump usually did not deliver enough water to properly maintain the boiler level. Trouble with the feed caused some owners to equip their cars with two additional pumps, a steam pump and a hand pump.

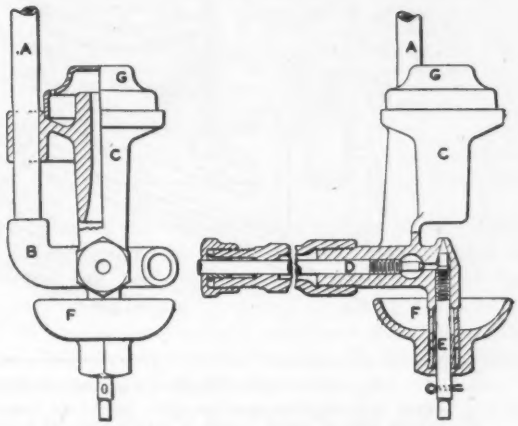


Fig. 18—Pilot light. A, fuel pipe; B, curved gasoline vaporizer tube; C, burner body; G, perforated burner cap; F, fuel cap for starting.

Fig. 20—1907 model White designed on gasoline-car lines.

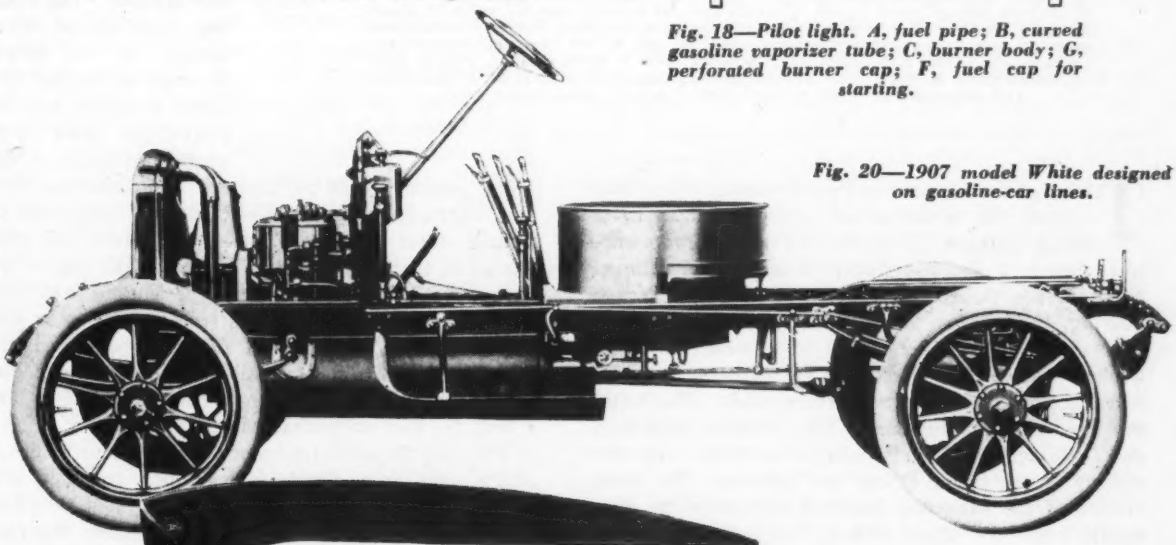
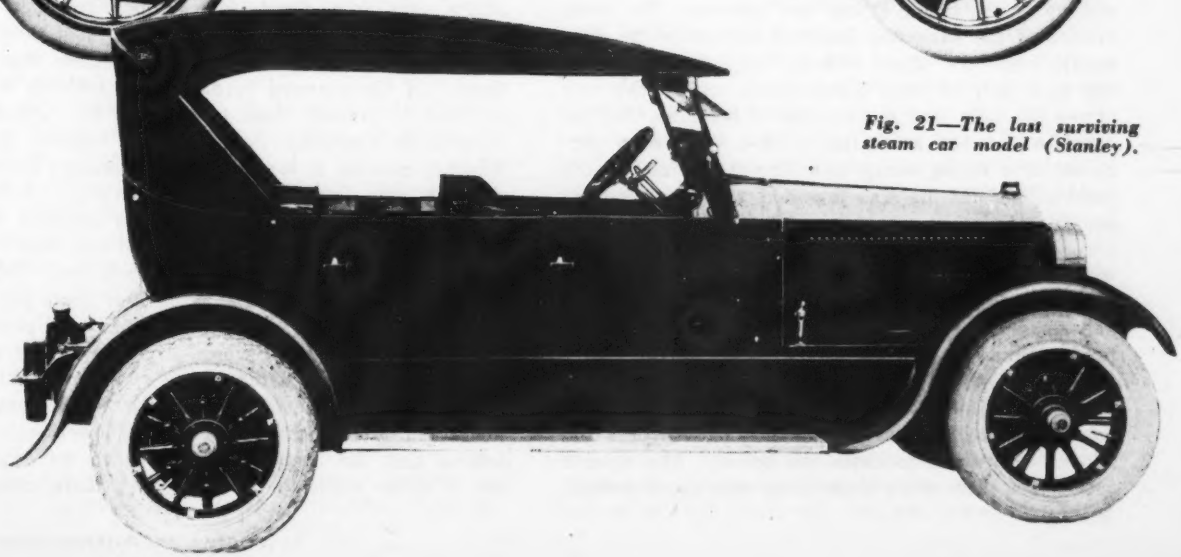


Fig. 21—The last surviving steam car model (Stanley).



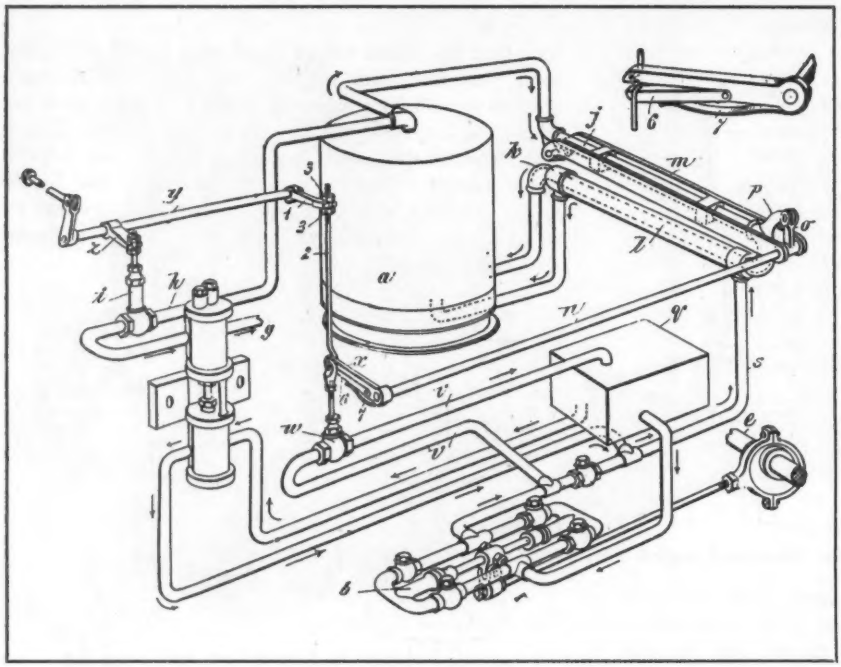


Fig. 19—Victor (Bullard) automatic boiler feed system.

a, boiler; b, double-barreled plunger pump; e, pump-operating eccentric shaft; g, exhaust pipe of steam pump; h, steam pipe for pump; i, control valve of steam pump; j, unjacketed tube of thermostatic valve; k, jacketed tube of thermostatic valve; l, jacket of thermostatic valve tube; m, one of the two steel bars of the thermostatic valve; p, bracket on unjacketed tube; o, lever arm; n, control shaft of bypass valve; q, water tank; s, feed pipe; y, hand-control shaft for bypass valve and steam-pump valve; z, hand-control arm of steam-pump valve.

Part Four

In 1904 the Stanley Brothers brought out a new model which showed many improvements over their previous designs. The steam was superheated by allowing it to expand through an orifice to a lower pressure, but this principle was later abandoned again. A high boiler pressure (400 psi instead of the previous 200) was carried; a water-level indicator replaced the fragile water glass; the fuel-feed system was redesigned so that only a small fraction of the fuel supply was under air pressure, and the engine was completely enclosed and geared directly to the rear axle. This car had a wheelbase of 79 in., as compared with 56 in. for the original Locomobile, and was a runabout with a front compartment that could be opened to form a seat for two additional passengers.

That the Stanleys reengaged in the manufacture of steam cars immediately after their contract with Barber and Walker had been completed must have been very annoying to the Locomobile and Mobile organizations, but there seems to have been nothing in the contract to prevent them from doing so. After the Locomobile Company had acquired control of the Whitney patents, it brought suit for alleged infringement of these patents against the Stanleys. A representative of the company at the time issued a statement in which—referring to the suit—he said:

"The Locomobile Company controls the Whitney Motor Wagon Company and is back of these proceedings, and will push the suit as vigorously as possible. We consider that the Stanley Brothers have treated us very shabbily, as after selling us all their patents. they followed by themselves manufacturing steam vehicles and offering them for sale at a lower price. We believe that the Stanley patents which we acquired are of minor value to the Whitney patents, although

THE Victor steam car had an automatic boiler feed system, the invention of James H. Bullard, of which a diagram is shown in Fig. 19. Two pumps were fitted, a double-cylinder, single-acting plunger pump driven positively from the rear axle through gearing, and a steam pump. The former supplied the feed water while the car was in motion, the latter while it was at rest. Feed was regulated by a bypass valve under the control of a thermostat. The latter consisted of a small-diameter tube running once back and forth across the body back of the boiler, and connecting to the boiler at top and bottom. The lower branch of the tube was jacketed and cooled by feed water, while the upper branch was fastened at one end to a pair of steel plates extending all the way across the body, one on each side of the tube. On the opposite end the two arms of the tube were connected by a fitting which also formed the inlet to the jacket. This fitting was provided with an upwardly projecting arm, to which was pin-jointed an arm on a rocker shaft controlling the bypass valve. As the water level in the boiler rose and fell, the upper arm of the thermostatic tube alternately filled with water and steam. When water was replaced by steam, the temperature rose and the tube expanded. The length of the steel plates remained constant, and the expansion of the tube resulted in a slight angular movement of the rocker shaft, which closed the bypass and allowed the water to enter the boiler. The reverse action took place when water level rose above normal.

important in that they cover certain useful structural details."

The suit was brought early in 1902. Some time later it was announced that it had been withdrawn, but no explanation for the withdrawal was given. About 20 years later, when the last of the Stanley brothers died, an obituary appeared in a Boston paper in which it was stated that the brothers had sold their steam-carriage business for a quarter million dollars and had later bought it back for $30,000. This lent substance to the belief that the suit had been settled out of court.

During the first year of the Locomobile Company's activities it enjoyed a sellers' market if ever there was one. This applies particularly to the demand for agencies. It was only a short time after the catastrophic collapse of the bicycle business, and many former bicycle jobbers and dealers were looking for new outlets for their energies. Many others also had become interested in the new mode of locomotion, through the five years of agitation which had preceded it, and were willing to cast their lot with the new industry. Conditions at the Locomobile plant are reflected by an experience of the late Carl Fisher, of Prest-O-Lite fame. He had been a bicycle racer in his early years, and wished to get into the sales end of the horseless carriage business, so he went to Bridgeport with the object of securing an agency. But after sitting in the outer office for three days without getting a hearing, he gave up and went to Tarrytown, where he secured the Indiana State rights for the Mobile. This reference to "three days in the outer office without getting a hearing" may bring back memories of similar experiences in Bridgeport to some oldtimers who may read this, for the habit of showing little regard for the sensibilities of business callers persisted at the Locomobile plant long after the sellers market had vanished.

All of the earlier steam vehicles were essentially runabouts, and designs for carrying more than two passengers were makeshifts of one kind or another, such as dos-a-dos, cars with collapsible front seats, etc. About 1903, however, the demand for touring cars became very insistent. This compelled manufacturers of steam cars to rearrange their powerplants, so that the body could be designed practically without regard to the powerplant. The chassis of a White 1907 limousine, with the boiler under the front seat and the engine under the hood, is shown in Fig. 20.

It was in connection with steam cars that the practice of selling through dealers was first introduced in the automobile industry, for the early manufacturers of gasoline cars produced on such a small scale and the more successful ones had such a demand for their vehicles that they had no need for agents. One of the first dealers was James A. Kline of Harrisburg, Pa., who secured the Mobile agency in 1900. Kline tells of some of the difficulties encountered by the owners of these early vehicles substantially as follows:

"After a novice had been taught how to operate the machine and was left to his own resources, about the first thing he did was to forget to turn on the water from the feed pump to the boiler. This resulted in burning out the boiler, which usually meant re-expanding the tubes, at a cost of about $10. After the boiler had been burned out about three times, the tubes, where they passed through the header plates, became so thin that it was impossible to make a steam-tight joint by re-expanding, and a new set of tubes at a cost of about $60 was then necessary.

"Another difficulty was to keep the water gage intact so it would correctly indicate the water level in the boiler. As a pressure of about 200 psi was carried, the glass would often break, and until it was replaced you had to guess at the amount of water in the boiler. Replacing the glass with the pressure on was a difficult job, as the rubber gaskets would blow out, and if the gland nuts were screwed up too tight, the glass tube would break.

"The greatest difficulty of all, however, was to keep the fire going properly on a windy day when the car was standing. After the burner had been lit for some time and the vaporizer heated up, the pressure regulator acting on the fuel supply was supposed to keep the pressure down to 200 psi automatically. This was somewhat lower than the pressure for which the safety valve was set, and to keep the pressure within this limit, the fire naturally had to be burned very low, with the result that the least gust of wind would cause a 'back-fire,' that is, burning of the vapor where it issued from the gasoline nozzle at the side of the burner. In a little while the vaporizing device, which was heated by the main burner, would cool off sufficiently to allow raw gasoline to flow from the burner nozzle and flood the burner. Then, if one was not careful, he would light the burner, and the result was a fire. However, as long as the car was under way the burner usually worked well, for then the fire was going full tilt and, besides, the exhaust steam was directed down the discharge flue for the burnt gases."

A great deal of trouble was experienced with the wire wheels of the early light steamers, which were much too light in both the spokes and the rims. At that time owners were not averse to paying $50 for a set of wood wheels to replace the wire wheels, a condition of affairs which was reversed some time later

The development of the steam engine, however, is not by any means at an end. High-speed designs, the vertical multi-cylinder type modeled on the Diesel engine, and the adaptability of the steam engine in general to the demands of marine propulsion, traction and even aviation, still hold great possibilities which can only be hinted at here. In all of these varied spheres of application the steam engine has definite advantages to offer.

It is at any rate a mistake to believe that the steam engine is obsolete, or to dismiss it with the unfounded assertion that it can only be used for low pressures and for saturated steam or slight superheat. Adaptation to high steam pressures is on the contrary a simple matter in the reciprocating engine, and as far as temperatures are concerned the upper limit of admissibility for the modern Sulzer steam engine has already been shown to lie in the neighborhood of 400 C.—O. Walti in Sulzer Technical Review.

when the triple-laced demountable wheel was introduced here.

There was relatively little Government interference with the use of steam carriages in this country. When these vehicles first appeared on the highways, their manufacturers and owners were advised that the boilers were subject to inspection, the same as all other high-pressure boilers. Gasoline-fired steam carriages were transported on ferry boats, but their fires had to be extinguished before they were pushed onto the boats, and they were segregated at the rear end of the deck. Convincing proof of the lack of explosion hazards was furnished by the manufacturers who had their boilers inspected, and leading insurance companies issued insurance on approved makes. While the ownership and operation of a steam car may have involved a few extra formalities and precautions, these certainly did not preclude the practical success of the vehicle.

For a period of about two years, from early in 1900 when the Locomobile Co. went into production, until the end of 1901, the light steamer held an easy supremacy in the American automobile market. On the assumption that the Stanley design met all practical requirements, the Locomobile, Mobile, and several other companies had built factories and installed equipment for quantity production as it was then understood, which enabled them to offer the light vehicles at attractive prices. The vehicles themselves had many obvious attractive features, and eager purchasers were not lacking. But with their introduction in service their many faults became only too apparent, and as simultaneously light, silent and low-priced gasoline runabouts appeared on the market, the popularity of the steamer began to wane. It was the curve dash Oldsmobile runabout, more than any other car, that took the market away from the steamer, and the writer remembers one of his associates remarking at the time that in East Orange, one of New York City's high-class suburbs, these gasoline runabouts were "as thick as flies." Some of the concerns which had been engaged in the manufacture of steam cars, like the Locomobile Co. of America, took up the manufacture of gasoline vehicles, while others went out of business. At the New York show in January, 1905 only three makes of steam car were on exhibition and these, together with the Stanley, which was not shown, were about all that were left.

With the ascendency of the gasoline automobile the latter became a model for steam-car manufacturers in various respects. Thus from 1904 on, either the boilers or the engines were located under a hood in front, the engines were completely enclosed, and gear drive was used. The dimensions of the vehicles and the outputs of their engines were increased, and bodies similar to those of gasoline cars were fitted. The White Co. even introduced a two-speed gear mounted on the rear axle. On hills the low-speed gear was used, which enabled the engine to keep up its speed and obviated the need for pumping feed water by hand.

Still the market continued to decrease, and soon the Stanley and the White were the only makes left. One of the factors in the gradual disappearance of the steamer was that the average service-station staff knew little or nothing about steam powerplants, and it was very difficult to get service. In the smaller communities, particularly, the steam-car owner was thrown practically on his own resources. Finally, in 1911 the White Co. decided to discontinue the manufacture of steamers and to confine itself to the production of gasoline cars, upon which it had entered some years earlier. The Stanley company continued operations until 1923, when it was placed in the hands of a receiver. The brothers had withdrawn from active connection with the firm when a reorganization took place, in 1917, and one of them was killed in an accident during the early twenties.

It must not be assumed that the final disappearance of the steamer was due in any way to the many defects of the early designs, on which considerable stress has been placed in this article, for most of these defects had long been eliminated. The postwar Stanley car, of which a photograph is shown in Fig. 21, had a wheelbase of 130 in., considerably more than twice as long as that of the prototype, and in appearance differed little from the gasoline cars of the period. It had no water glass, the water level being read off an indicator dial on the dash. There was no need for pumping up air pressure by hand, as fuel feed was by a power pump. A condenser was fitted and one water supply was good for between 100 and 200 miles. The water supply, moreover, could be replenished by means of a steam siphon. A thermostatic valve automatically shut off the fuel supply to the boiler when the water level therein dropped dangerously low. Kerosene was used as fuel, except in the pilot light, which latter was ignited by a so-called sparking gas lighter. The steam was superheated, and the engine was enclosed and drove directly to the rear axle by spur gears.

The falling off in the demand for steam cars therefore was not due in any way to lack of engineering development; on the contrary, the last steam car models were "over-engineered," if anything. These cars sold at prices ranging from $2750 for the runabout to just below $4000 for a seven passenger limousine. Well built gasoline cars of the same size could be bought for about one-half that price, so that the steam enthusiast had to "dig deep" if he wanted to remain true to his convictions.

In closing it may be apropos to say a few words regarding attempts to stage a comeback of the steam car. The first of these was made in 1916, by Abner Doble, who designed and built a steam car on the lines of the then current gasoline-car models. The Doble car figured prominently in the public prints of the period, and at one time no less than three Doble steam-car companies were listed in industrial directories, domiciled, respectively, in Maine, Michigan, and California. But the writer was informed that no more than ten Doble cars were built in the United States, and if this be true, a much greater tonnage of paper must have been consumed in Doble publicity than the steel tonnage that went into Doble cars. One alibi for the failure of Doble's Detroit venture was that wartime restrictions (World War I) made it impossible to get materials. However, these restrictions were in force for a relatively short time, and if the undertaking had otherwise been sound, it would undoubtedly have survived them.

During the third decade of the century, when the production of giant pneumatic tires made possible rapid development of motor-bus services, some promoters saw the solution of the bus problem in steam power. One of the factors that had contributed to the failure of the private steam passenger car, the lack of service facilities, did not have to be counted with in public-service undertakings, as these could organize and train their own service staffs. At least four or five companies did development work on steam buses, but not one of them reached the production stage.

The above article, "RISE AND DECLINE OF THE AMERICAN STEAM CAR INDUSTRY" was published in AUTOMOTIVE AND AVIATION INDUSTRIES during 1946 in four installments, and has been reprinted here in the GAZETTE through the courtesy of the publishers of AUTOMOTIVE AND AVIATION INDUSTRIES.

AUTOMOBILIANA IN MUSIC

by by Albert Brouse

Back in 1938, the writer, a charter member of the newly formed Horseless Carriage Club, was presented with a stack of old music by his next-door neighbor. These songs of every conceivable type——classical, semi-classical, and popular,—had been accumulating over a period of years until an annual spring house-cleaning brought them to light. Rather than dispose of them to the junk dealer, they were offered to me and accepted, with some misgivings as I had no idea what to do with a lot of out-dated sheets of music, many of them much the worse for age and wear. However, in glancing through them, I spotted three or four with pictures of automobiles on their covers. Being interested in anything along that line, I put them aside as being a part of the general run of Automobiliana. A few days later I came across some more in a second-hand dealer's shop and decided then and there that I had found an interesting and informative hobby. Since the day I have begged, traded, and sometimes bought any song pertaining to the automobile either in title, cover picture, or text until at present my collection numbers over one hundred separate numbers, and is still growing.

Being a musician, I have been interested in the musical content of these songs and have recorded a number of the more novel ones in a style which I hope to be reminiscent of the days in which they were written. I also possess several of the old cylinder type phonograph automobile recordings which arouse nostalgic memories when played on the ancient Edison.

Glancing over the many titles and cover pictures, I was impressed by the variety and scope of subjects pertaining to the automobile that were touched upon. Almost every phase of every day life was influenced to some extent by the advent of the successor to the horse, and these changes were faithfully reflected in the popular songs of the first part of the twentieth century.

Analyzing and grouping the titles under separate headings, we find that many of the well-known cars had songs written about them extolling their virtues and, in some cases, sponsored by the manufacturers themselves. Examples are the familiar "Merry Oldsmobile" first published in 1905

and re-issued with different covers in 1915, 1921, and 1938. The Ford leads the list with at least four songs published specifically mentioning it in the title, and several others with allusions in the text. The earliest—"The Ford," was published by the Ford Motor Co. in 1908 and pictures the first of the Model T's. Other Ford songs include "The Little Ford Rambled Right Along"—1914, "I Didn't Raise My Ford to be a Jitney"—1915, "On the Old Back Seat of the Henry Ford"—1916, "It's a Rambling Flivver"—1917, and "Flivver King"—1926, all on the Model T, and "Poor Lizzie" of 1928 and "Henry's Made a Lady out of Lizzie"—1928 to celebrate the advent of the Model A. The Ford V-8 is mentioned in the text of "I'm an Old Cowhand"—1936, thus completing the cycle. Other well-known makes advertised in song are the "Cole 30 Flyer"—1910, "In My Mercer Racing Car"—1913 "Mack's Swell Car was a Maxwell"—1915, "Happy Tom O'Day"—1915 (Humpmobile), "Over the Overland Route in an Overland Car to Overland"—1917, "Take Me on a Buick Honeymoon"—1922 "My Studebaker Girl"—1923, and "Ray and his little Chevrolet"—1924. In all cases the covers are embellished with colorful pictures of the subject and the texts make frequent reference to the virtues of the particular car advertised.

Getting away from the more commercial side, we find romance prominently stressed in the early automobile songs. "Out in an Automobile"—1905 and "On an Automobile Honeymoon"—1905 set to appropriate waltz themes hint the wooing possibilities of the Horseless Carriage with it's chummy single seat and tiller drive. Advice of a more practical turn is offered in "Keep Away from the Fellow who Owns an Automobile"—1912 (an early Irving Berlin song) and "Beatrice Fairfax, Tell Me What to Do"—1915. Other numbers strictly in the romance department include "That's When I'll Marry You"—1915, "Don't take Advantage of My Good Nature"—1919, "Honey, I'm in Love with You"—1925, "I'm Ridin' Straight To Heaven on a One-Way Street"—1931, and "Gee, Dear, I'm Lonesome"—1931. Romance in reverse is shown by "I'm Getting Ready for my Mother-in-Law"—1906 and "I Don't Want to Marry You"—1928.

The mechanical difficulties of the early cars are well illustrated in the picture and text of "That Auto Ought to Go"—1908, "Bump, Bump, Bump in Your Automobile"—1912 and "He'd Have to Get Under"—1913, (the latter a best seller). Various types of cars and mechanical improvements start with the "Dawn of the Century"—1900 and progress through the era of the Jitney Bus and Taxicab with such songs as "Taxicab"—1910, "Taxi" 1919, "Let's Take a Ride on the Jitney Bus"—1915, and "Father is Driving a Jitney Bus"—1915. The rumble seat craze inspired "Get 'em In a Rumble Seat"—1929, and "Tumble in a Rumble Seat"—1933. Busses are represented by "Motor Transit Stages See You Through"—1926 (an advertising poem without music), "Us on a Bus"—1935, and "Love on a Greyhound Bus"—1945.

The possibilities of the motor car in furnishing the younger generation with sport and speed are well represented in "Auto Race"—1908, "In High Spirits"—1909, "Take Me Out for a Joy Ride"—1909, "Motor King"—1910, "The Speed Kings"—1912, and "The Big Red Motor"-1913. This was the era of the speedster, without which no manufacturer's line was considered complete. This hybrid model, consisting of merely the bare essentials of the automobile, was really the predecessor of the present day "hopped-up" high school boy's jalopy—the only difference being that in those days it was considered the plaything of the wealthy "sport". The cover pictures on these particular songs picture long, low racy speedsters with helmeted and goggled men driving through clouds of dust — seemingly oblivious to all physical discomfort.

Back in the early days of the automobile a woman driver was quite a novelty, consequently songs depicting this phenomenon were popular. Examples are "Josette"-1904 (issued as a newspaper supplement) and "The Gay Chauffer"-1906. Another sign of the times was "I'm Wild about Horns that Go Ta-Ta Ta-Ta"—1928, celebrating the advent of the musical horn.

Along about 1915, the automobile "got religion" with the advent of Billy Sunday and the song-writers came up with "When Sunday Comes to Town"-1915 and "I Love my Billy Sunday but Oh, You Saturday Night"-1917. The stage came in for its share, too, with a picture of Eddie Foy and the seven little Foys grouped around and in an Overland speedster on the cover of "Just a Night in Dreamland"—1915. Also worthy of notice is a weird and grotesque contraption under the title of "Hunkatin"—1918. "Michael and his Motorcycle"-1916 shows Michael and his girl-friend riding on "the cute little seat behind".

Students of American slang will be interested in the number of automobile songs whose titles reflect some current topical expression or allusion. Typical of these are "Whoa! Nellie!"—1915, "Come On, Papa"-1918, "Say, Young Feller"-1918 "How Ya Gonna Keep 'em Down on the Farm"—1919 (the last three a product of World War I), "I'm a Cake-Eating Man"—1922, "Wow!"—1923, "Me and The Boy Friend"—1924, "Insufficient Sweetie"—1924, "Hard To Get Gertie"—1926, "Me Too" 1926, "That Brand New Model of Mine"—1928, "Gotta Big Date with a Little Girl"—1928, "Everything is Okey Dokey"—1935, and "You've Got What It Takes"—1935.

The dance is represented by some very colorful covers of early-day vehicles—the music usually consisting of a march and one-step or a waltz. Some of these are "Kareless Koon"—1899 (one of the earliest automobile numbers, with a cartoon-like cover of a darkie in a Horseless Carriage) "Ebony Flyer"—1903 (more of the same), "Up Broadway"—1900, "Auto Rag"—1905, "Motor March"—1906 (containing a beautiful picture of an early-day Rambler), "Honeymoon Waltz"—1909, "At the Tango Ball"—1914, "The Town Club"—1915 and "Somewhere On Broadway"—1917. The longing for home and the lure of vacation-land are shown in "You'll Never Know That Old Town of Mine"—1915, "I'm Going to Hit the Trail to My Home Town"—1916, "Toot your Horn for Camp Curry"—1918, and "To California"—1923. The fire department is celebrated by "Still Alarm"—1914, and World War II by "Little Bo-Peep has Lost her Jeep"—1942.

In conclusion, one may derive much pleasure and education by looking back over the various musical compositions inspired by the automobile, from its early "Horseless Carriage" days down through its awkward years of transition to the present sleek means of locomotion so essential to a modern world.

A chronological list of Automobile Songs follows:

1899
- Kareless Koon

1900
- Dawn of the Century
- Up Broadway

1903
- The Ebony Flier

1904
- Josette

1905
- In My Merry Oldsmobile
- Auto Rag
- Out in an Automobile
- On an Automobile Honeymoon
- I live in Lazyland

1906
- The Gay Chauffeur
- " " " (different cover)
- The Motor March
- I'm Getting Ready for my Mother-in-Law

1908
- The Ford
- Auto Race
- That Auto Ought to Go

1909
- In High Spirits
- Honey Moon Waltz
- Take me Out for a Joy Ride

1910
- Motor King
- Cole "30" Flyer
- Taxicab

1912
- Bump, Bump, Bump in your Automobile
- The Speed Kings
- Keep Away from the Fellow who Owns an Automobile

1913
- He'd Have to Get Under
- White Crest
- In My Mercer Racing Car
- The Big Red Motor

1914
- The Little Ford Rambled Right Along
- I'll Do It All Over Again
- At the Tango Ball
- Still Alarm

1915
Happy Tom O'Day
Mack's Swell Car was
a Maxwell
Let's Take a Ride on
the Jitney Bus
Father is Driving
a Jitney Bus
That's When I'll Marry You
Whoa! Nellie!
The Town Club
You'd Never Know that
Old Town of Mine
Gasoline Gus and
his Jitney Bus
When Sunday Comes to Town
Just a Night in Dreamland
I Want a Ride in a
Jitney Bus
Mr. Whitney's
little Jitney Bus
Beatrice Fairfax, Tell
Me What to Do
In My Merry Olds-
mobile (1915 edition)
I didn't Raise my Ford
to Be a Jitney
On the Old Back Seat
of the Henry Ford

1916
Michael on his Motorcycle
I'm Going to Hit the
Trail to My Home Town

1917
Somewhere on Broadway
It's a Rambling Flivver
I Love my Billy Sunday,
but Oh You Saturday Night

1918
Over the Overland Route
in an Overland Car
to Overland
Toot your Horn
for Camp Curry
Hunkatin
Say, Young Feller
Come On, Papa

1919
Don't Take Advantage
of my Good Nature
Taxi
How 'ya Gonna Keep 'em
Down on the Farm

1922
I'm a Cake-Eating Man
Take me on a Buick
Honeymoon

1923
Wow!
To California
My Studebaker Girl

1924
Me and the Boy Friend

1924 (ctd.)
Ray and his Little
Chevrolet
Insufficient Sweetie

1925
Honey, I'm in Love with You

1926
Hard-to-get Gertie
Flivver King
Motor Transit Stages
Take You Thru
Up an' Down the
Eight Mile Road
Me, Too!
Here Comes Emaline

1927
Get 'em in a Rumble Seat

1928
Gotta Big Date with
a Little Girl
I Don't Want to Marry You
Poor Lizzie
Henry's Made a Lady
Out of Lizzie
That Brand New Model
of Mine
I'm Wild about Horns
that go Ta-ta ta-ta

1929
Rumble Seat
Ich Habe Kein Auto

1931
Gee, Dear, I'm Lonesome
I'm Ridin' Straight
to Heaven
Ho-Hum

1933
Tumble in a Rumble Seat

1935
You've Got What it Takes
The Traffic was Terrific
Everything is Okey Dokey

1936
Us on a Bus
I'm an Old Cowhand

1937
Have You Got any
Castles, Baby?
An Automobile has
Two Big Eyes

1938
In My Merry Olds-
mobile (1938 edition)

1942
Little Bo-Peep has
Lost her Jeep

1945
Love on a Greyhound Bus

OUR NEW MEMBERS

Berger, Joe, 1157 No. Normandie Av., Los Angeles 27, Calif.
Bilodeau, Kenneth R., 3917 Whittier Place, Riverside, Calif.
Bonell, John A., 115 Annandale Road, Pasadena 2, Calif.
Downey, Don H., 2635 Walnut Grove Av., Garvey, Calif.
Gilmour, G. A., 811 No. Western Av., Los Angeles 27, Calif.
Gillies, Wm. B. Jr., 6671 Kinsman Rd., Pittsburgh 17, Penna.
Goldschen, Julius Z., 6080 Alcott St., Los Angeles 35, Calif.
Greenough, Hamilton P., 30 Tollis Av., Santa Barbara, Calif.
Greenough, Mrs. Hamilton P., 30 Tollis Av., Santa Barbara, Calif.
Halverson, Leslie L., St. Olaf, Iowa
Hannum, Robert, 161 W. Colden Av., Los Angeles 3, Calif.
Hansen, Paul, 1366 Poplar St., San Bernadino, Calif.
Hanvey, Fred W., Gaylord, Minn.
Hayes, Wm. K., 2935 N. E. Broadway, Portland 12, Oregon.
Hoyle, Lassiter, 2467 Glyndon Av., Venice, Calif.
Jacobs, Paul F., 1328 West Wayne St., Fort Wayne 2, Indiana
Kleinschmidt, Jacob, Arnold, Missouri
Larson, H. A., 57 South Main St., Cedar City, Utah.
Markee, C. S., 3210 Oakshire Drive, Hollywood 28, Calif.
Merry, H. Claude, 5806 Delmar Blvd., St. Louis, 12, Mo.
Perrins, Warren R., Furman Road, Rte. 1, Fairport, New York
Phillips, A. R. Jr., 843 S. Citrus Av., Los Angeles 36, Calif.
Seitz, Geo. B., 214 Grand Av., Oakland 10, Calif.
Semrau, A. M., Ortonville, Minnesota
Staley, John E., 1141 Cardiff Ave., Los Angeles 35, Calif.
Strong, Sidney M., Atwater, Minn.
Tibbitts, Jonathan C., Box 1018, Central Valley, Calif.
Tibbitts, Walter F. C., 920 Grand St., Alameda, Calif.
Von Behren, M. E., 6208a Ridge Ave., Wellston, Missouri
West, C. Gifford III, Searington Rd. & Rt. 25D,
Roslyn Hts., L. I., N. Y.
Whipple, Howard B., 54 Mountwood Rd., Swampscott, Mass.
Wiglesworth, Jasper, 627 Shawnee Rd., Kansas City, Kansas.

TREASURER'S REPORT FOR THE YEAR 1946

Cash in Bank, Jan. 1st, 1946		$455.88
Receipts		
Dues from members	$1284.27	
Sale of Club Emblems	72.25	
Sale of Gazettes	104.09	
Sale of other publications	94.06	
Advertising in Gazette	20.00	
Field Meets-Refreshments, etc.	86.70	
Miscellaneous income (Badges, AMA Books, etc.)	54.75	
		$1716.12
		$2172.00
Disbursements		
Printing Gazette (4 issues)	$ 936.03	
Stationery	130.71	
Postage	100.57	
Cost of other publications	59.91	
Printing (Announcements, etc.)	124.74	
Emblems (Advance payment)	155.00	
Field Meet expenses	46.66	
Refunds on Emblems	20.00	
Refund on Dues	6.00	
Miscellaneous expenses	69.04	$1648.66
Cash in Bank, Jan. 1st, 1947		$523.34

HERBERT ROYSTON - TREASURER

WANTED

N.A.C.C. Handbooks, all years, have 1908-1908 to trade, will trade books in on parts. Also want Ford Times, up to 1920. Fred Mc Kenrick, 603 N. Center St., Ebensburg, Penna.

Rolls Royce Wire Wheels, size 7.00x19. Art Stewart, 1507 Fifth Ave., Pittsburgh 19, Penna.

261973 (V.8)

WANTED

Catalogue, Instruction book, for 1912 Pope-Hartford. Also Boyce Motometer in operating condition. L. C. Partridge, 712 Federal St., Chicago 5, Illinois.

1909 model automobile, EMF (Every-Morning-Fix) preferred, but interested in any make that is not now manufactured. Glenn E. Thomas, East Anaheim at Elm, Long Beach, California.

Locomobile "48" hood. 4 cyl. Stutz radiator, cowl lamps, literature, ring and pinion gears, any other parts. 30 x 3½ solid tires. A. K. Miller, Montclair, New Jersey.

Bulb horn, short type (bulb fastens directly to horn). Also, bulb horn with tube. Antique cars in the rough within 250 miles of Albany, New York, or St. Petersburg, Florida.

1918-1922 Nash Sport Touring. 1915-1917 Scripps-Booth, 1915-1917 Pathfinder 12. Wm. G. Cain Jr., 1918 Washington Ave., S. E., Cedar Rapids, Iowa.

Information on operation and lubrication of 1906 Maxwell, 1900 Oldsmobile, 1914 R. C. Hupo. Joe Niewiek, Rte. 2, Byron Center, Michigan. Also 32x3½ or 33x4 S. S. tires, and 28 x 3 clincher with tubes.

Photos and literature on old models of tractors, steam and gas. David N. Allison, 300 St. Pierre Rd., Los Angeles 24, California.

Curved-Dash Oldsmobile, Leslie L. Halverson, St. Olaf, Iowa.

Tires, speedometer, and hub caps for a 1927 Buick. C. E. H. Whitlock, Bethany, Connecticut.

Two side oil lamps for 1912 EMF "30". Also Jericho exhaust horn for Flanders. Floyd Clymer, 2125 W. Pico St., Los Angeles 6, California.

Various issues of THE FORD TIMES, from 190- to 1914, to complete collection. Please list each issue. Will buy or trade for. Also need Stutz DV-32 instruction book. P. S. de-Beaumont, P. O. Box 3802, Cleveland 10, Ohio.

White Steam Car Engine or entire White Steam Car. State year and condition. Marshall M. Brewer, P. O. Box 802, Fort Bragg, North Carolina.

FOR SALE

Model T Ford Parts, almost a complete stock of good used parts, fenders, '16 to '23 windshields, dem. rims and wheels, rear fenders 1913 to 15, touring car doors, 1913 and later, 50 side oil lamps 1916 to 20, some new, headlamps electric - 1915 to 27, 10 complete motors, starters, and generators (need overhaul), 50 side curtains - odd, some new for 1908-09 models. Most parts less than half price of new. Maxwell A and AA parts, all chassis parts, hoods, radiators, magneto, etc. Olds curved dash, chains, and some odd items. Cadillac, 1910 magneto, 50 new top bows, upper part only, fit any socket, 50 odd cranks, 50 odd lenses, 50 odd head and side lamp brackets; license brackets, etc. International high wheel car, parts most for MW model. Hupo 1908-09 side doors, 4 sets (this was an extra), brass foot and robe rails, hub caps for 1912 Buick. Tires, New 32 x 3½ SS, 31 x 4 SS, others in used, 32 x 4. Packard 30 brass headlamps, fine set, Several fine brass sets for cars of 1906-08, two sets square brass sides. Pennsylvania license plates for all years. Many other items. Write while this stock lasts. Also 1914 T Ford Touring, excellent mechanical condition, new tires, (needs good paint job) $375.00. 1914 T Ford truck, Martin-Perry body fine shape, good paint and tires, $375.00. Both cars have full set of lamps and horns. 1916 Allen touring car, good shape, 'tho needs paint and two seat cushions, $135.00. 1921 Hudson touring 7 pass, needs some work, but complete, body good, odd wheels, as is $90.00. International model A truck, chassis good, motor apart, body poor, good for parts, $100.00. Photos of cars to interested buyers, 10¢. Parts are selling fast, order items you need at once, or write: Mc Kenrick's Cycle Shop, 603 N. Center St., Ebensburg, Penna.

FOR SALE

Sale or trade; Pennsylvania and eastern license plates, name plates, and literature. Write for details. Swigart Museum, Huntingdon, Penna.

Rausch & Lang electric 5 pass. brougham. Price, $1000. Ted Bowers, 441 Jacobs Court, Palo Alto, California.

To trade; a few brass headlamps, good condition, Frederick E. Bissell, Jr., 325 Alpine St., Dubuque, Iowa.

To trade; Practical Mechanical Engineering books, Volumes 1, 2, and 3., by Carl S. Dow, S. B. 1907. (Not automotive, only mechanical). Want photos of American made cars 1910 or earlier, or old automobile magazines, pre 1910. Wayne Bledsoe, 8030 Troost, Affton 23, Missouri.

1919 Cadillac Touring, 7 pass. licensed, driven daily. $80.00 F.O.B. Dubuque. Frederick E. Bissell, Jr., 325 Alpine St., Dubuque, Iowa.

1924 Stanley Steamer, new marine boiler, Ford wheels, hydraulic brakes, & good tires. No body. Robert I. Fleming, 738 E. 16th St., Los Angeles, California

1915 Mercer Phaeton by original purchaser. This model was the first streamlined car in the United States and fastest Mercer ever produced. Same engine as used in Grand Prix. Model 22-70, engine number 2450. Perfect condition. Clyde E. Loose, 10 West Eager Street, Baltimore, Maryland.

Pictures of old time cars in rural settings. Many to select from. 20th Century-Fox Studios thought these pictures so valuable that they bought an entire set. Send for price list. Albert Mecham, 140 Michigan Avenue, Highwood, Illinois.

33x4 and 34x4 tires; 32x4, 33x4, and 34x4 inner tubes. New Condition. John C. Hill, Jr., Box 4, Martinsville, Ill.

1924 Franklin Touring, New tires and fine condition. Used daily by present owner. Also several 32x4 tires and tubes. Set of 1924 Rolls-Royce head and side lamps. New acetylene welding and cutting outfit. Electric hand drill, tools, aluminum remnants, etc. R. E. Daniels, 6125 Glen Oak, Hollywood 28, California. HEmstead 4639.

1914 Jeffery, fine running condition. W. Lawson Jones, 1276 No. Sweetzer Ave., Los Angeles 46, Calif. HE 9413.

Antique automobiles, lamps, tires, etc., Stanley 20 HP engine, rear axle and pumps, Hunt Steamer chassis with extra parts, blue prints, patterns, etc., Rausch & Lang 1917 electric roadster with new Edison Batteries and complete recharging outfit. Art Austria, 200 Mildred Ave., Venice, Calif.

Now Ready, Clymer's new book "Henry Ford---His Life, His Work, His Genius". 384 pages, 75 illustrations. This is a "must" for your automotive library; paper cover, $3.00; Board cover with gold leaf lettering, $4.00. Send your order for this book as well as other Clymer publications to Herbert Royston, Secretary, P. O. Box 503, West Los Angeles 25, Calif.

Souvenir Pictorial of Glidden Tour Revival. Size 21½ x 16¾. Gives complete details of Tour with many reprints of newspaper coverage. Price, $1.00. Order from Duane C. White, 173 Cedar St., Roxbury 19, Massechusetts.

Apperson Motor, about 1923, fine condition. Oil lamps with bails for left side of car. N. C. Ensworth, 215 23rd Avenue, North, St. Petersburg, Florida.

New books by Clymer: "Fastest on Earth", $2.00. "Speedway Motorcycle Racing", $2.00. "Motorcycle Speedway Annual", $1.00. Send orders for the above or any other Clymer publications to Secretary, Herbert Royston, P. O. Box 503, West Los Angeles 25, California.